SAMSUNG

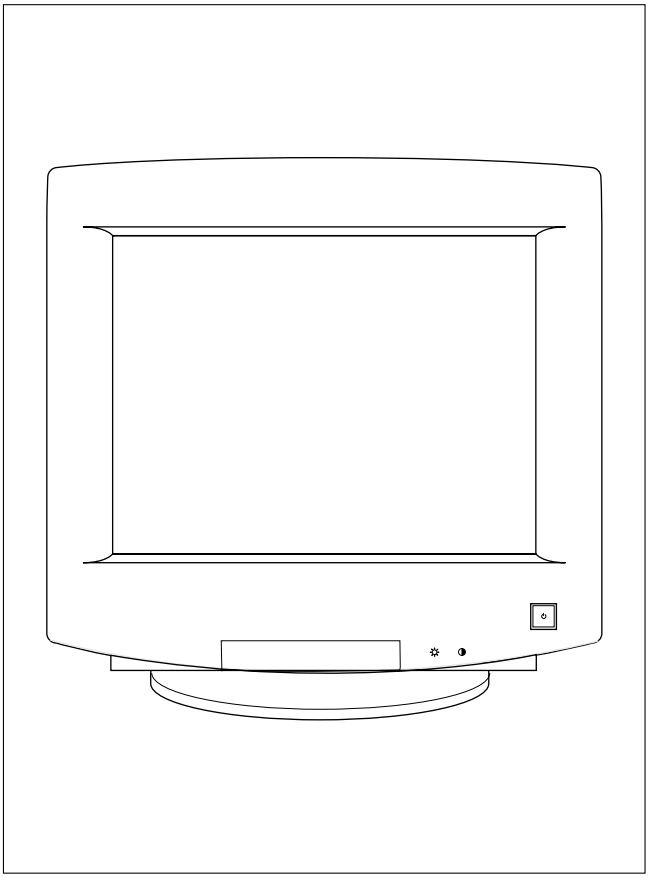
COLOR MONITOR

CSH7839L
(SyncMaster 700p Plus)

CSH9839L
(SyncMaster 900p)

SERVICE Manual

COLOR MONITOR



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1 Precautions

1-1 Safety Precautions

WARNINGS

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

1-1-1 Servicing the High Voltage VR and CRT :

WARNING: A high voltage VR replaced in the wrong direction may cause excessive X-ray emissions.

Caution: When replacing the high voltage adjustment VR, it must be fixed by a soldering iron after it is properly set.

1. When servicing the high voltage system, remove the static charge by connecting a 10 kohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead.
2. If the HV VR requires adjustment, (a) Replace the VR and adjust the high voltage to the specification. (b) Use a soldering iron to melt the adjustment cap on the HV VR to prevent any movement.
3. When troubleshooting a monitor with excessively HV, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.
4. High voltage should always be kept at the rated value, no higher. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
5. When the HV regulator is operating properly, there is no possibility of an X-ray problem. Make sure the HV does not exceed its specified value and that it is regulating correctly.
6. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT only with one that is the same or equivalent type as the original.
7. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.
8. Do not lift the CRT by the neck.

1-1-2 Fire and Shock Hazard :

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   WARNING: Do not use an isolation transformer during this test.
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).
4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

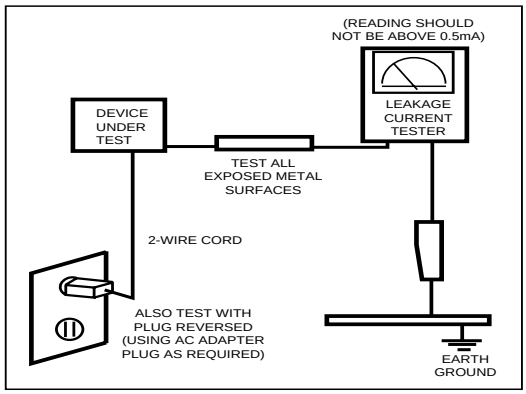

(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Figure 1-1. Leakage Current Test Circuit

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

Components identified by ☢ on schematics and parts lists must be sealed by a soldering iron after replacement and adjustment.

1-2 Servicing Precautions

WARNING1: First read the "Safety Precautions" section of this manual. If unforeseen circumstances create conflict between the servicing precautions and safety precautions, always follow the safety precautions.

WARNING2: A high voltage VR replaced in the wrong direction may cause excessive X-ray emissions.

WARNING3: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet, and should be followed closely.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect all test components in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ Indicates ESDs on the Schematic Diagram in this manual.

2 Reference Information

2-1 List of Abbreviations, Symbols and Acronyms

2-1-1 Abbreviations

Abbreviation	Definition
ASS'Y	Assembly
B	Blue
B+ ADJ	B+ Adjustment
B-CUT	Blue-Cutoff
B-GAIN	Blue Gain
BRIGHT	Brightness
C	R-Composition
C-MIC	Condenser Microphone
CLK	Clock
CM	R-Cement
CN	Connector
CONT	Contrast
D-SUB	D-Subminiature
EEP-CLK	Electrically Erasable and Programmable Clock
EXT	External
EXT-MIC	External Microphone
Freq.	Frequency
FU	Fusible
G	Green
G-CUT	Green-Cutoff
G-GAIN	Green Gain
GND	Ground
H	Horizontal
H	Heater
H-DRV	Horizontal Drive
H-DY	Horizontal Deflection Yoke
H-FLB	Horizontal Flyback
H-FV	Horizontal-Feedback Voltage
H-LIN	Horizontal Linearity
H-POSI	Horizontal Position
H-SIZE	Horizontal Size
H/PHONE	Headphone
Hz	Hertz
I-SENSE	Current-Sense
Ib	Pound
MAX	Maximum
MIC	Microphone
MIN	Minimum
MP	C-Metalized Polyester
MPP	Metal Polypropylene
MO	R-Metal Oxide

Abbreviation	Definition
OSC	Oscillator
P	C-Polyester
PARA	Parabola
PARALL	Parallelogram
PIN-BAL	Pincushion Balance
PRE-AMP	Pre-Amplifier
PS1	Power Saving1 (suspend)
PS2	Power Saving2 (off)
PWR	Power
R	Red
R-CUT	Red-Cutoff
R-GAIN	Red Gain
RST	Reset
S-PIN	Side Pincushion
S-RASTER	Self Raster
S/W	Switch
SCAP	S Correction Capacitor
SPK	Speaker
SYNC	Synchronization
T	C-Tantalum
TR	Transistor
TRAP	Trapezoid
U-COM	Microprocessor
V	Vertical
V-DY	Vertical Deflection Yoke
V-FLB	Vertical Flyback
V-LIN	Vertical Linearity
V-MUTE	Video Mute
V-OUT	Vertical Output
V-PARA	Vertical Parabola
V-POL	V-Polarity
V-POSI	Vertical Position
V-SENSE	Voltage-Sense
V-SIZE	Vertical Size
WW	R-Wire Wound
X-TAL	Crystal
Ω	ohm
KΩ	1000 ohm
MΩ	1000 KΩ
uF	microfarad (10^{-6}F)
nF	nanofarad (10^{-9}F)
pF	picofarad (10^{-12}F)

2-1-2 Symbols

- Can emit X-radiation
- Hot Ground
- Cold Ground
- Electrostatically Sensitive Device (ESD)
- Provides special safety considerations

2-1-2 Acronyms

Acronym	Definition
ABL	Automatic Brightness Limits
AC	Alternating Current
ACL	Automatic Contrast Limit
AFC	Automatic Frequency Control
ANSI	American National Standards Institute
CMOS	Complementary Metal Oxide Semiconductor
CRT	Cathode Ray Tube
DC	Direct Current
DDC	Data Display Channel
DF	Dynamic Focus
DMM	Digital Multimeter
DPMS	Display Power Management Signaling
DVM	Digital Voltmeter
DY	Deflection Yoke
EEPROM	Electrically Erasable and Programmable Read only Memory
ESD	Electrostatically Sensitive Device
ESF	Electronic Static Field
FBT	Flyback Transformer
FET	Field Effect Transistor
FH	Horizontal Frequency
FS	Fail Safe
FV	Vertical Frequency
GD	Geometric Distortion

Acronym	Definition
H/V	Horizontal/Vertical
HV	High Voltage
I/O	Input/Output
IC	Integrated Circuit
LED	Light Emitting Diode
MAC	Macintosh
MOFA	Mask Outside Frame Assembly
OCP	Over Current Protection
OP AMP	Operational Amplifier
OSD	On Screen Display
P-P	Peak to Peak
PCB	Printed Circuit Board
PLL	Phase Locked Loop
PWM	Pulse Width Modulation
SMPS	Switch Mode Power Supply
SVGA	Super Video Graphics Array
SWEDAC	
TP	Test Point
UL	Underwriters Laboratories
USB	Universal Serial Bus
VESA	Video Electronics Standard Association
VGA	Video Graphics Array
VR	Variable Registor
W/B	White Balance

3 Product Specifications

3-1 Specifications

Item	Description	
Picture Tube:	19-Inch (48.2 cm): 18-inch (45.7 cm) viewable, 17-Inch (43 cm): 16.0-inch (40.6 cm) viewable, 0.26 mm Dot pitch, Full-square flat-face tube, 90° Deflection, Anti-Reflection coating with Anti-electrastatic, Medium short persistence phosphor	
Scanning Frequency	Horizontal : 30 kHz to 96 kHz (Automatic) Vertical : 50 Hz to 160 Hz (Automatic)	
Display Colors	Unlimited colors	
Maximum Resolution	Horizontal : 1600 Dots Vertical : 1200 Lines	
Input Video Signal	Analog, 0.714 Vp-p positive at 75 Ω, internally terminated	
Input Sync Signal	Separate Sync : TTL level positive/negative Composite Sync : TTL level positive/negative Sync-on-Green : Composite sync 0.286 Vp-p ± 5%/negative (Video on Vp-p positive)	
Maximum Pixel Clock rate	205 MHz	
Active Display	CSH9839L; Horizontal : 352 mm ± 3 mm (4:3 ratio) / 330 mm ± 3 mm (5:4 ratio) Vertical : 264 mm ± 3 mm CSH7839L; Horizontal : 306 mm ± 3 mm (4:3 ratio) Vertical : 230 mm ± 3 mm	
Input Voltage	AC 90 to 264 Volts, 60/ 50 Hz ± 3 Hz	
Power Consumption	130 Watt (max)	
Dimensions	CSH7839L	CSH9839L
Unit (W x D x H) Carton (W x D x H)	16.3x17.5x17.2 Inches (415 x 445.7 x 437.3 mm) 21x22.3x21.6 Inches (535 x 566 x 549 mm)	18.4x19.6x19 Inches (468 x 499 x 483.2 mm) 22.6x23.2x22.8 Inches (573 x 590 x 580 mm)
Weight (Net/Gross)	CSH9839L; 49.6 lbs (22.5 kg) / 58.8 lbs (26.7 kg) CSH7839L; 40.8 lbs (18.5 kg) / 49.6 lbs (22.5 kg)	
Environmental Considerations	Operating Temperature : 32°F to 104°F (0°C to 40°C) Humidity : 10 % to 80 % Storage Temperature : -4°F to 113°F (-20°C to 45°C) Humidity : 5 % to 95 %	

- CSH7839L/CSH9839L complies with SWEDAC (MPR II) recommendations for reduced electromagnetic fields.
- Designs and specifications are subject to change without prior notice.

3-2 Pin Assignments

Sync Type / Pin No.	15-Pin Signal Cable Connector (Figure 3-1)		Cable Adapter (Figure 3-2)
	Separate	Composite	Macintosh
1	Red	Red	GND-R
2	Green	Green	Red
3	Blue	Blue	H/V Sync
4	GND	GND	Sense 0
5	DDC Return	DDC Return	Green
6	GND-R	GND-R	GND-G
7	GND-G	GND-G	Sense 1
8	GND-B	GND-B	Reserved
9	Reserved	Reserved	Blue
10	GND-Sync/Self-raster	GND-Sync/Self-raster	Sense 2
11	GND	GND	GND
12	DDC Data	DDC Data	V-Sync
13	H-Sync	H/V-Sync	GND-B
14	V-Sync	Not Used	GND
15	DDC Clock	DDC Clock	H-Sync

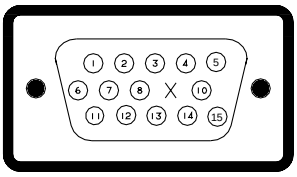


Figure 3-1. Male Type

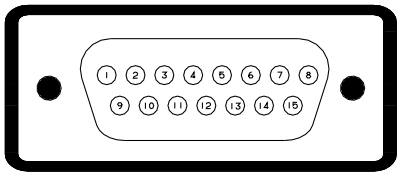


Figure 3-2. Male Type

BNC Connectors

BNC connectors are used with coaxial cable for improved signal transmission. Better signal transmission becomes critical at high frequencies, such as those required for 1280 x 1024 resolution. Most video boards that operate at 1280 x 1024 resolution recommend using coaxial cable with BNC connectors. The 5 BNC connectors on the rear of the monitor can accept Red, Green and Blue video. Composite sync can be applied separately, or combined with the Green video signal (commonly referred to as “composite sync-on green”). If composite sync-on-green is used, then only 3 of the 5 BNC connectors are used. The connectors are labeled accordingly.

Pin Assignment	Signals		
	Sync-on-Green	Composite Sync	Separate Sync
1	Red	Red	Red
2	Green + Sync	Green	Green
3	Blue	Blue	Blue
4	NC	H/V Comp. Sync	H-Sync
5	NC	NC	V-Sync

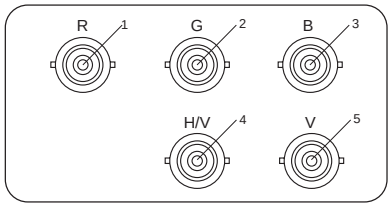


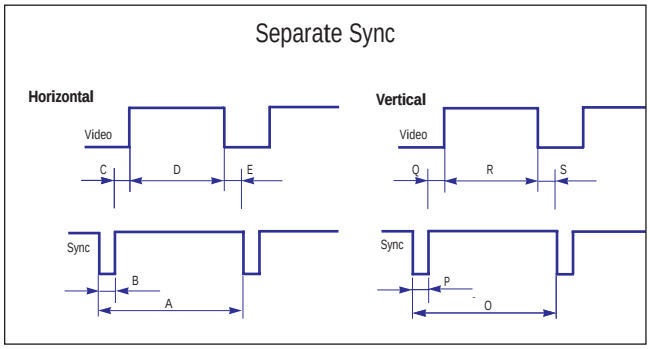
Figure 3-3. BNC Signal Input Type

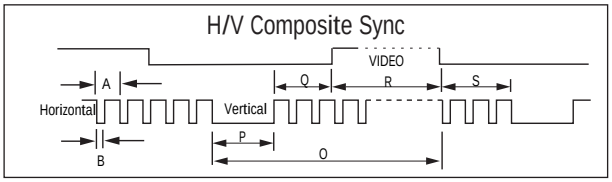
3-3 Timing Chart

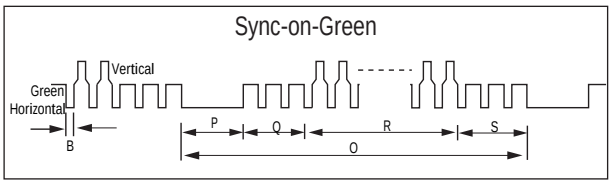
This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 3-1. Timing Chart (CSH7839L)

Mode / Timing	IBM		VESA							MAC.
	VGA2/70 Hz 720 x 400	VGA3/60 Hz 640 x 480	640/85 Hz 640 x 480	800/85 Hz 800 x 600	1024/75 Hz 1024 x 768	1024/85 Hz 1024 x 768	1024/100 Hz 1024 x 768	1280/75 Hz 1280 x 1024	1280/85 Hz 1280 x 1024	832/75 Hz 832 x 624
fH (kHz)	31.469	31.469	43.269	53.674	60.023	68.677	81.400	79.976	91.146	49.726
A µsec	31.778	31.778	23.111	18.631	16.660	14.561	12.285	12.504	10.971	20.110
B µsec	3.813	3.813	1.556	1.138	1.219	1.016	0.988	1.067	1.016	1.117
C µsec	1.907	1.907	3.810	2.702	2.235	2.201	1.624	1.837	1.422	3.910
D µsec	25.422	25.422	5.222	14.222	13.003	10.836	9.037	9.481	8.127	14.524
E µsec	0.636	0.636	17.778	0.569	0.203	0.508	0.635	0.119	0.406	0.559
fV (Hz)	70.087	59.940	85.008	85.061	75.029	84.997	100.000	75.025	85.024	74.551
O msec	14.268	16.683	13.333	11.756	13.328	11.765	10.000	13.329	11.761	13.414
P msec	0.064	0.064	0.080	0.056	0.050	0.044	0.037	0.038	0.033	0.060
Q msec	1.080	1.048	0.427	0.503	0.466	0.524	0.516	0.475	0.483	0.784
R msec	12.711	15.253	12.800	11.179	12.795	11.183	9.435	12.804	11.235	12.549
S msec	0.413	0.318	0.027	0.019	0.017	0.015	0.012	0.013	0.011	0.020
Clock Freq. (MHz)	28.322	25.175	36.000	56.250	78.750	94.500	113.309	135.000	157.500	57.284
Polarity H.Sync	Negative	Negative	Negative	Positive	Positive	Positive	Negative	Positive	Positive	Negative
V.Sync	Positive	Negative	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Negative
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	SOG



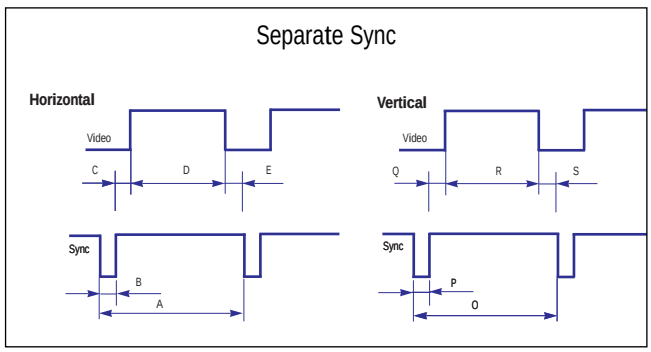


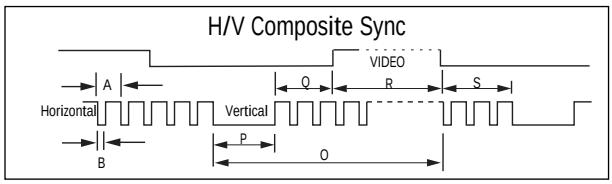


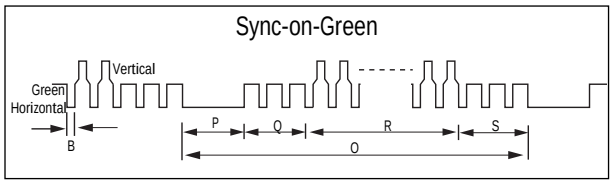
A : Line time total	B : Horizontal sync width	O : Frame time total	P : Vertical sync width
C : Back porch	D : Active time	Q : Back porch	R : Active time
E : Front porch		S : Front porch	

Table 3-2. Timing Chart (CSH9839L)

Mode / Timing	IBM		VESA							MAC.
	VGA2/70Hz 720 x 400	VGA3/60Hz 640 x 480	640/85 Hz 640 x 480	800/85 Hz 800 x 600	1024/85 Hz 1024 x 768	1024/100 Hz 1024 x 768	1280/75 Hz 1280 x 1024	1280/85 Hz 1280 x 1024	1600/75 Hz 1600 x 1200	1152/75 Hz 1152 x 870
fH (kHz)	31.469	31.469	43.269	53.674	68.677	81.400	79.976	91.146	93.750	68.681
A µsec	31.778	31.778	23.111	18.631	14.561	12.285	12.504	10.971	10.667	14.560
B µsec	3.813	3.813	1.556	1.138	1.016	0.988	1.067	1.016	0.948	1.280
C µsec	1.907	1.907	3.810	2.702	2.201	1.624	1.837	1.422	1.501	1.440
D µsec	25.422	25.422	5.222	14.222	10.836	9.037	9.481	8.127	7.901	11.520
E µsec	0.636	0.636	17.778	0.569	0.508	0.635	0.119	0.406	0.316	0.320
fV (Hz)	70.087	59.940	85.008	85.061	84.997	100.000	75.025	85.024	75.000	75.062
O msec	14.268	16.683	13.333	11.756	11.765	10.000	13.329	11.761	13.333	13.322
P msec	0.064	0.064	0.080	0.056	0.044	0.037	0.038	0.033	0.032	0.044
Q msec	1.080	1.048	0.427	0.503	0.524	0.516	0.475	0.483	0.491	0.568
R msec	12.711	15.253	12.800	11.179	11.183	9.435	12.804	11.235	12.800	12.667
S msec	0.413	0.318	0.027	0.019	0.015	0.012	0.013	0.011	0.011	0.044
Clock Freq. (MHz)	28.322	25.175	36.000	56.250	94.500	113.309	135.000	157.500	202.500	100.000
Polarity H.Sync	Negative	Negative	Negative	Positive	Positive	Negative	Positive	Positive	Positive	Negative
V.Sync	Positive	Negative	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Negative
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	SOG







A : Line time total	B : Horizontal sync width	O : Frame time total	P : Vertical sync width
C : Back porch	D : Active time	Q : Back porch	R : Active time
E : Front porch		S : Front porch	

4 Opearating Instructions

4-1 Front View and Control

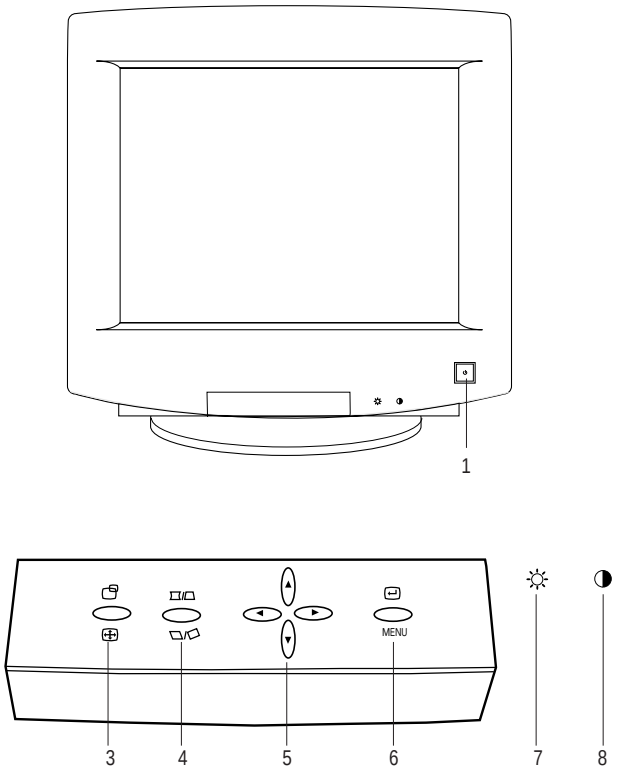


Figure 4-1. Front View and Controls

Table 4-1. Front Panel Controls

Location	Symbol	Description
1		Power Button
2		Power Indicator LED (Dual Color)
3		Size Button/Position Button
4		Parallel Button/Trapezoid Button
5		Adjustment Button
6	MENU	Menu Button
7		Brightness Control
8		Contrast Control

4-2 Power Management System

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor into a low-power mode when it has not been used for a certain amount of time. The available modes are “On,” “Standby,” “Suspend,” and “Off.”

This system operates with a VESA DPMS compliant video card installed in your computer. You use a software utility installed on your computer to set up this feature. See the table below for details.

Note 1: This monitor automatically returns to normal operation when horizontal and vertical sync return. This occurs when you move the computer's mouse or press a key on the keyboard.

Note 2: This monitor is EPA Energy Star compliant and NUTEK compliant when used with a computer equipped with VESA DPMS functionality. If your computer system cannot support a display power management function, you can purchase an optional DPMS software program to enable the power saving function. Please contact Samsung or your dealer for more information.

Note 3: For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods.

Table 4-2. Display Power Management Signaling (DPMS)

State / Items	Normal Operation	Power Saving Function EPA/NUTEK		
		Standby Mode	Suspend Mode/ Position A1	Power-off Mode/ Position A2
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Amber	Amber/Green Blinking	Amber Blinking
Power Consumption	130 W (max.) 110 W (nominal)	70 W (nominal)	Less than 15 W	Less than 5 W

5 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CSH7839L / CSH9839L monitors.

WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.

5-1 Disassembly

Cautions: 1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

5-1-1 Before making Disassembly

1. Disconnector signal cable and power cord from the monitor.
2. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base close to you.
3. Make sure nothing will damage the screen.

5-1-2 Cabinet Disassembly

1. To uncover the 2 uppermost screws. Press in the end of each screw cap and pull it away from the cabinet.
2. Remove the 4 screw on the Rear Cover and pull it toward to remove it.

Figure 5-1

5-1-3 Removing the Stand

1. Pull the tab outward on the Chassis Bottom and pull the Tilt and Swivel Base up to remove it.

Figure 5-2

5-1-4 Removing the Top Shield

1. Remove the 4 screws on the Top Shield Cover and remove the Shield.

Figure 5-3

5-1-5 Removing the Bottom Shield

1. Remove the 1 screw on the Bottom Shield Cover.
2. Lift off the Bottom Shield.

Figure 5-4

5-1-6 Removing the CRT Socket PCB

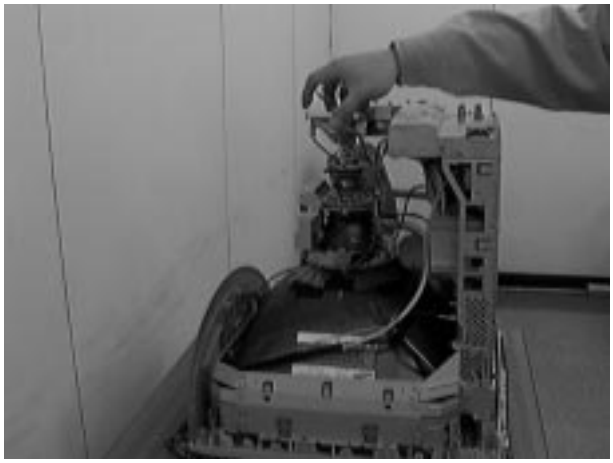


Figure 5-5

1. Disconnect connectors GT186 and GT188 on the CRT PCB Assembly.
2. Disconnect the CRT Socket PCB Assembly.

5-1-7 Removing the Video PCB Assembly

1. Remove the 4 screws (both side and Rear part of Main PCB Bracket) on the Video PCB.
2. Disconnect CN402, CN104, CN102, CN301 and CN105 on the Video PCB Assembly.
3. Lift off the Video PCB Assembly.

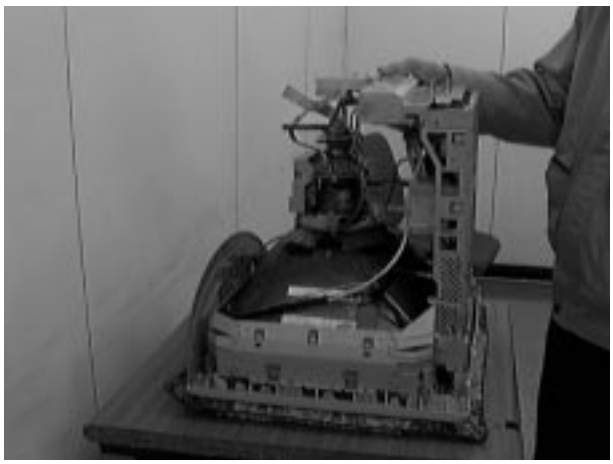


Figure 5-6

5-1-8 Removing the Video PCB Assembly Rear Shield and Video PCB

1. Remove the 9 screws on the PCB Assembly.
2. Using pinch-nosed pliers or long-nosed pliers, pull both side taps of Video PCB Assembly.
3. Lift off the Video PCB Assembly Rear Shield.
4. Remove the 3 screws on the Video PCB Bracket.
5. Lift out the Video PCB and pleat it on a flat, level surface that is protected from static electricity.

Figure 5-7

5-1-9 Removing the Main PCB Assembly

1. Remove both side screws (4 screws) on the lower edge of the CRT Bracket.
2. Remove Chassis Ground Wire on the side of the left.
3. Disconnect CN203, CN601, H_DY and Anode Cap on the Main PCB Assembly.

Figure 5-8

5-1-10 Removing the Main PCB

1. Remove 7 screws on the main PCB.
2. Pull the Main PCB towards you and carefully lift out the main PCB and placet it on a flat, level surface that is protected from static electricity.

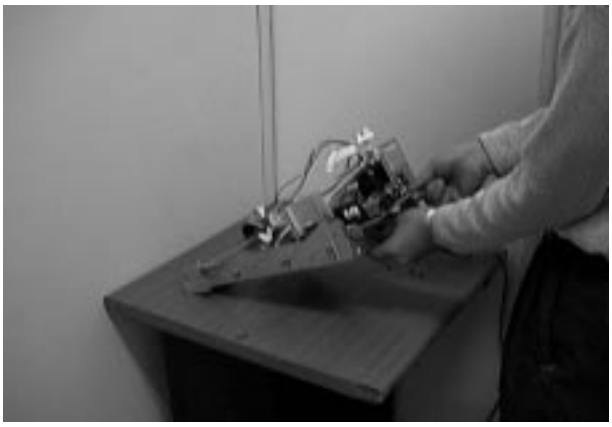


Figure 5-9

5-1-11 Removing the Bracket

1. Remove the 10 screws on the Front Cabinet.

Figure 5-10

5-1-12 Removing the Degaussing Coil

1. Using pinch-nosed pliers or long-nosed pliers, carefully push the 4 plastic ties on the Bracket.
2. Lift the Degaussing Coil Assembly from the Bracket.

Figure 5-11

5-2 Reassembly

Reassembly procedures are in the reverse order of Disassembly procedures.

6 Alignment and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor. Direction is given for adjustment using the monitor Interface Board Ver. 2.0 and software (SoftJig).

6-1 Adjustment Conditions

Caution: Changes made without the SoftJig are saved only to the user mode settings. As such, the settings are not permanently stored and may be inadvertently deleted by the user.

6-1-1 Before Making Adjustments

6-1-1 (a) ORIENTATION

When servicing, always face the monitor to the east.

6-1-1 (b) MAGNETIC FIELDS

Whenever possible, use magnetic field isolation equipment such as a Helmholtz field to surround the monitor. If a Helmholtz field is not available, frequently degauss the unit under test.

Caution: Other electrical equipment may cause external magnetic fields which may interfere with monitor performance.

Use an external degaussing coil to limit magnetic build up on the monitor. If an external degaussing coil is not available, use the internal degaussing circuit. However, do not use the internal degaussing circuit more than once per 30 minutes.

6-1-1 (c) WARM-UP TIME

The monitor must be on for 30 minutes before starting alignment. Warm-up time is especially critical in color temperature and white balance adjustments.

6-1-1 (d) SIGNAL

Analog, 0.714 Vp-p positive at 75 ohm, internal termination
Sync: Separate / Composite
(TTL level negative / positive)

Sync-on-Green:
Composite sync 0.286 Vp-p negative
(Video 0.714 Vp-p positive)

6-1-1 (e) SCANNING FREQUENCY

Horizontal: 30 kHz to 96 kHz (Automatic)
Vertical: 50 Hz to 160 Hz (Automatic)

Unless otherwise specified, adjust at the 1024 x 768 mode (H: 68 kHz, V: 85 Hz) signals.

Refer to Table 3-1 on page 3-3.

6-1-1 (f) +B 220 V LINE ADJUSTMENT

Signal: 1024 x 768 mode (68 kHz / 85 Hz)
Display image: Full white
Contrast: Maximum
Brightness: Maximum

6-1-1 (g) HIGH VOLTAGE ADJUSTMENT

Signal: 1024 x 768 mode (68 kHz / 85 Hz)
Display image: Full white
Contrast: Maximum
Brightness: Maximum
Limit: 27 kV ± 0.5 kV (19")
26 kV ± 0.5 kV (17")

Measure the hight voltage level at the anode cap. High voltage should be within the limit as above. If the high voltage needs adjustment use the following procedure.

PROCEDURE

1. Turn the power off and disconnect the AC line cord from the power source.
2. Unsolder and remove VR501 on the Main PCB.
3. Replace VR501 and adjust the high voltage to the specification.
4. Using a soldering iron, melt the adjustment cap on VR501 to prevent any movement.

6-1-1 (h) G2 (SCREEN) VOLTAGE ADJUSTMENT

Signal: 1024 x 768 mode (68 kHz / 85 Hz)
Display image: Full white
Contrast: Maximum
Brightness: Maximum

Adjust the Screen VR of the FBT so that the G2 (Screen) Voltage for SDD is 600 V ± 10 V, for Hitachi it is 600 V ± 10 V and for Toshiba it is 700 V ± 10 V.

6-1-1 (i) CENTER RASTER

Adjust VR401 so that the back raster comes to the center when you apply a signal of 93 kHz / 85 Hz.

6-1-1 (j) BRIGHTNESS AND CONTRAST

Unless otherwise specified, adjust control volumes:

Brightness: Maximum
Contrast: Maximum

6-1-2 Required Equipment

The following equipment may be necessary for adjustment procedures:

6-1-2 (a) DISPLAY CONTROL ADJUSTMENT

1. Non-metallic (–) screwdriver: 1.5 mm
   Non-metallic (–) screwdriver: 3 mm
2. Philips (+) screwdriver: 1.5 mm
3. Non-metallic hexkey: 2.5 mm
4. Digital Multimeter (DMM), or
   Digital Voltmeter (DVM)
5. Signal generator, or
   Computer with a video board that uses the ET-4000 chipset (strongly recommended if using Samsung DM 200 software) and that displays: 1280 x 1024 @ 85 Hz, or 1600 x 1200 @ 85 Hz (maximum).
6. Personal computer
7. Required software: Softjig.exe from Samsung which includes the cg17p.c data file Samsung DM200, or DisplayMate for Windows from Sonera Technologies
8. Interface Board Ver. 2.0 Code No. BH81-90001K
9. Parallel communications cable (25-pin to 25-pin); Code No. BH81-90001H
10. Signal cable (15-pin to 15-pin cable with additional 3-pin connector); Code No. BH81-90001J
11. 5 V DC adapter, not supplied

Note: SoftJig Ass'y (includes items 8, 9 and 10) Code No. BH81-90001L

6-1-2 (b) COLOR ADJUSTMENTS

1. All equipment listed in 6-1-2 (a), above
2. Color analyzer, or any luminance measurement equipment

6-1-3 Connecting the SoftJig

Connect the monitor to the signal generator and / or PC as illustrated in Figures 6-1 and 6-2.

Note: The signal cable connector which includes the 3-wire cable must connect to the monitor. If you use Setup 2 (PC only, no signal generator) you can only make adjustments to the signal timing available on that computer system. To make corrections to all factory timings requires the use of an additional signal generator.

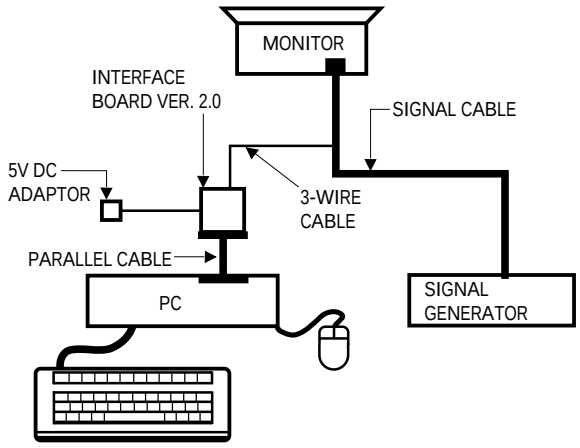


Figure 6-1. Setup 1, With Signal Generator

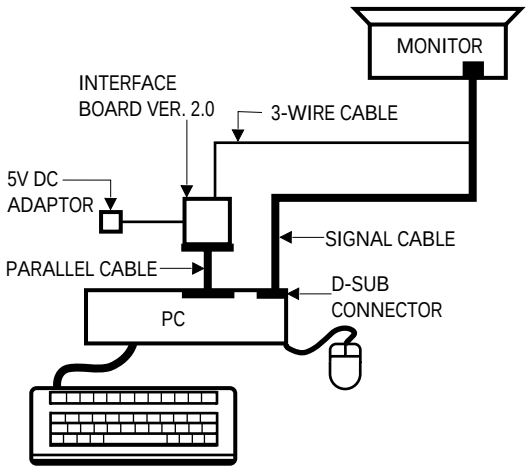


Figure 6-2. Setup 2, Without Signal Generator

6-1-4 After Making Adjustments

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing north, reposition the monitor to face east and readjust. This time, try for an adjustment closer to the ideal setting within the tolerance range. Test the unit again in all directions. If the monitor again fails to meet specifications in every direction, contact your Regional After Service Center for possible CRT replacement.

6-2 Display Control Adjustments

6-2-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display.

Adjust the horizontal size and vertical size to their optimal settings: 352 mm (H) x 264 mm (V) - 19", 306 mm (H) x 230 mm (V) - 17".
1024 x 768 mode (68 kHz/85Hz)

Adjust the horizontal position and vertical position to ≤ 4.0 mm of the center point of the screen.

|A-B| ≤ 4.0 mm. |C-D| ≤ 4.0 mm.

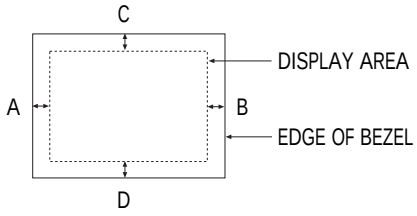


Figure 6-3. Centering

6-2-1 (a) HORIZONTAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency: 68 kHz/85 Hz
Display image: Crosshatch pattern
Brightness: Cut-off
Contrast: Maximum

Click on the << or >> box next to **H_SIZE** to adjust the horizontal size of the display pattern to 352 mm (19"), 306 mm (17"). (Tolerance: ± 3 mm.)

6-2-1 (b) VERTICAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency: 68 kHz/85 Hz
Display image: Crosshatch pattern
Brightness: Cut-off
Contrast: Maximum

Click on the << or >> box next to **V_SIZE** to adjust the vertical size of the display pattern to 264 mm (19"), 230 mm (17"). (Tolerance: ± 3 mm.)

6-2-1 (c) HORIZONTAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency: 68 kHz/85 Hz
Display image: Crosshatch pattern
Brightness: Cut-off
Contrast: Maximum

Click on the << or >> box next to **H_POSI** to center the horizontal image on the raster.

6-2-1 (d) VERTICAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency: 68 kHz/85 Hz
Display image: Crosshatch pattern
Brightness: Cut-off
Contrast: Maximum

Click on the << or >> box next to **V_POSI** to center the vertical image on the raster.

6-2-2 Linearity

Linearity affects the symmetry of images as they appear on the screen. Unless each row or column of blocks in a crosshatch pattern is of equal size, or within the tolerances shown in Tables 6-1 and 6-2, an image appears distorted, elongated or squashed.

Table 6-1. Factory Preset Modes Linearity

	Standard Modes Linearity	
	Each block (10 %)	Difference between adjacent blocks (4 %)
4 : 3 (19")	Horizontal: 20.9~23.1 Vertical : 20.9~23.1	Horizontal: Less than 0.88 mm Vertical : Less than 0.88 mm
4 : 3 (17")	Horizontal: 18.2~20.1 Vertical : 18.2~20.1	Horizontal: Less than 0.77 mm Vertical : Less than 0.77 mm
5 : 4 (19")	Horizontal: 19.60~21.65 Vertical : 20.9~23.1	Horizontal: Less than 0.82 mm Vertical : Less than 0.88 mm
5 : 4 (17")	Horizontal: 17.1~18.9 Vertical : 18.2~20.1	Horizontal: Less than 0.72 mm Vertical : Less than 0.77 mm

Table 6-2. Other Modes Linearity: VGA, SVGA, XGA, MAC, etc.

	Supported Timing Mode	
	Each block (14 %)	Difference between adjacent blocks (5 %)
4 : 3 (19")	Horizontal: 20.5~23.5 Vertical : 20.5~23.5	Horizontal: Less than 1.10 mm Vertical : Less than 1.10 mm
4 : 3 (17")	Horizontal: 17.8~20.5 Vertical : 17.8~20.5	Horizontal: Less than 0.96 mm Vertical : Less than 0.96 mm
5 : 4 (19")	Horizontal: 19.18~22.07 Vertical : 20.5~23.5	Horizontal: Less than 1.03 mm Vertical : Less than 1.10 mm
5 : 4 (17")	Horizontal: 16.7~19.2 Vertical : 17.8~20.5	Horizontal: Less than 0.90 mm Vertical : Less than 0.96 mm

6-2-2 (a) HORIZONTAL LINEARITY ADJUSTMENT

CONDITIONS

Scanning frequency: 68 kHz/85 Hz
Display image: Crosshatch pattern
Brightness: Cut-off
Contrast: Maximum

To adjust the Horizontal Linearity, refer to Tables 6-1 and 6-2 for the tolerance range.

Click on the << or >> box next to **H_LIN** to optimize the image.

6-2-2 (b) VERTICAL LINEARITY ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

To adjust the Vertical Linearity, refer to Tables 6-1 and 6-2 for the tolerance range.

Click on the << or >> box next to **V_LIN** to optimize the image.

6-2-3 Trapezoid Adjustment

CONDITIONS

Scanning frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

Click on the << or >> box next to **TRAPE** to make the image area rectangular.

| A - B | < 5 mm

Figure 6-4. Trapezoid

6-2-4 Pinbalance Adjustment

CONDITIONS

Scanning frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

| D1 |, | D2 | ≤ 2.0 mm

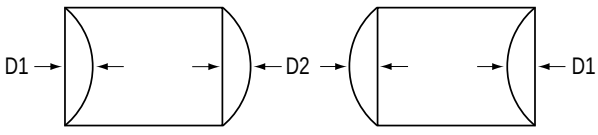


Figure 6-5. Pinbalance

Click on the << or >> box next to **PIN_BAL** to optimize the image.

6-2-5 Parallelogram Adjustment

CONDITIONS

Scanning Frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

Click on the << or >> box next to **PARALL** to make the image are rectangular.

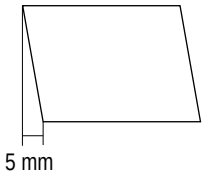


Figure 6-6. Parallelogram

6-2-6 Side Pincushion Adjustment

CONDITIONS

Scanning frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

Click on the << or >> box next to **BARREL** to straighten the sides of the image area.

| C1 |, | C2 | ≤ 2.0 mm, | D1 |, | D2 | ≤ 2.0 mm.

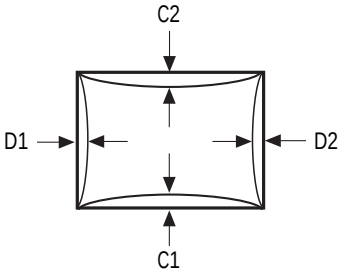


Figure 6-7. Pincushion

6-2-7 Tilt Adjustment

CONDITIONS

Scanning Frequency:	68 kHz/85 Hz
Display image:	Crosshatch pattern
Brightness:	Cut-off
Contrast:	Maximum

Click on the << or >> box next to **ROTATE** to correct the tilt of the display.

6-2-8 Degauss

No adjustments are available for the degaussing circuit. The degaussing circuit can effectively function only once per 30 minutes.

6-2-9 To Delete the User Mode Data

To delete the adjustment data from the user modes, click **USER DELETE.**

6-2-10 Save the Data

To save the adjustment data for a mode, press **FACTORY SAVE**.

6-3 Color Adjustments

6-3-1 Color Coordinates (Temperature)

Color temperature is a measurement of the radiant energy transmitted by a color. For computer monitors, the color temperature refers to the radiant energy transmitted by white. Color coordinates are the X and Y coordinates on the chromaticity diagram of wavelengths for the visible spectrum.

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	68 kHz / 85 Hz
Display Size :	352 (H) x 264 (V) - 19” 306 (H) x 230 (V) - 17”
Display image:	White flat field at center of display area
Brightness:	Cut-off
Contrast:	Maximum

PROCEDURE

Use the directions in sections 6-3-2 through 6-3-4 to adjust the color coordinates for:
9300K to x = 0.283 ± 0.02, y = 0.298 ± 0.02
6500K to x = 0.313 ± 0.02, y = 0.329 ± 0.02
5000K to x = 0.346 ± 0.02, y = 0.359 ± 0.02

6-3-2 Color Adjustments for 9300K

6-4-2 (a) BACK RASTER COLOR ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Back raster pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Select **COLOR CHANNEL 1** to control the color for 9300K.
2. Adjust the luminance of the back raster to between 0.3 to 1ft-L using the **G_CUT** controls.
3. Click on the << or >> box next to **B_CUT** to set the “y” coordinate to 0.298 ± 0.02.
4. Click on the << or >> box next to **R_CUT** to set the “x” coordinate to 0.283 ± 0.02.

   Note: If the above adjustments cannot be done to each coordinate, click on the << or >> box next to **G_CUT** to decrease or increase the green cutoff (bias) and repeat procedures 2 and 3.

6-3-2 (b) G-GAIN ADJUSTMENT

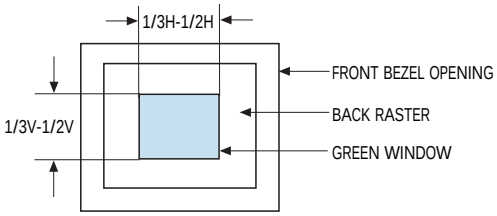


Figure 6-8. Green Box Pattern

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Green box pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Click on the << or >> box next to **G_GAIN** to adjust the brightness of the Green Gain to 25 ± 1 ft-L (19”), 30 ± 1 ft-L (17”).

   Note: If you can’t increase the Green Gain to the appropriate value, click on the >> box next to increase the **ABL** point.

6-3-2 (c) WHITE BALANCE ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Full white pattern
Brightness:	Cut-off
Contrast:	Maximum

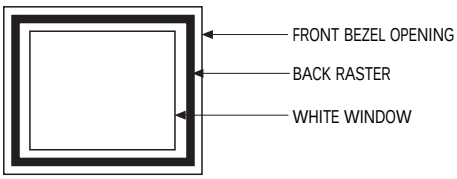


Figure 6-9. Full White Pattern

1. Click on the << or >> boxes next to **R_GAIN** and **B_GAIN** to make the video white. (For 9300K color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02.)

   Note: Do not touch the **G_GAIN** controls.
2. Check the ABL. If it is not within the specifications (30 ± 1 ft-L), use the ABL controls to adjust it.
3. Select **COLOR FACTORY SAVE** to save the data.

6-4-2 (d) WHITE BALANCE ADJUSTMENT VERIFICATION

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Back raster pattern
X-Y Coordinates:	x = 0.283 ± 0.02, y = 0.298 ± 0.02
Raster Luminance	0.3 ~ 1ft-L
ABL Luminance	30 ± 1 ft-L
Brightness:	Cut-off
Contrast:	Maximum

1. Check whether the color coordinates of the back raster satisfy the above spec.

   If they do not, return to 6-3-2 (a) and readjust all settings.
2. Display a full white pattern.

Note: Do not touch the **G_GAIN** controls.

3. Adjust the Contrast Control on the monitor so that the luminance of the video is about 5 ft-L.
4. Check whether the white coordinates of the video meet the above coordinates spec.
5. Adjust the Contrast Control again so that the luminance of the video is about 20 ft-L.
6. Check whether the white coordinates of the video satisfies the above spec.

   If they do not, return to 6-3-2 (a) and readjust all settings.

6-4-3 Color Adjustments for 6500K

6-4-3 (a) BACK RASTER COLOR ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Back raster pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Select **COLOR CHANNEL 2** to control the color for 6500K.
2. Adjust the luminance of the back raster to between 0.3 to 1.0 ft-L using the **G_CUT** controls.
3. Click on the << or >> boxes next to **R_CUT** and **B_CUT** to adjust the R-Bias to x = 0.313 ± 0.02 and the B-Bias to y = 0.329 ± 0.02.

6-4-3 (b) G-GAIN ADJUSTMENT

This procedure is the same as that for 9300K, refer to the procedure on page 6-5.

6-4-3 (c) WHITE BALANCE ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Full white pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Click on the << or >> boxes next to **R_GAIN** and **B_GAIN** to make the video white. (For 6500K color adjustment: x = 0.313 ± 0.02, y = 0.329 ± 0.02.)
2. Refer to the procedure for 9300K, section 6-3-2 (c) steps 2 and 3.

6-3-3 (d) WHITE BALANCE ADJUSTMENT VERIFICATION

Refer to the procedure for 9300K, section 6-3-2 (d).

6-3-4 Color Adjustments for 5000K

6-4-4 (a) BACK RASTER COLOR ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Back raster pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Select **COLOR CHANNEL 3** to control the color for 5000K.
2. Adjust the luminance of the back raster to between 0.3 to 1.0 ft-L using the **G_CUT** controls.
3. Click on the << or >> boxes next to **R_CUT** and **B_CUT** to adjust the R-Bias to x = 0.346 ± 0.02 and the B-Bias to y = 0.359 ± 0.02.

6-3-4 (b) G-GAIN ADJUSTMENT

This procedure is the same as that for 9300K, refer to the procedure on page 6-5.

Adjust the brightness of the **G_GAIN** less 5 ft-L than brightness of procedure for 9300K.

6-3-4 (c) WHITE BALANCE ADJUSTMENT

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	Full white pattern
Brightness:	Cut-off
Contrast:	Maximum

1. Click on the << or >> boxes next to **R_GAIN** and **B_GAIN** to make the video white. (For 5000K color adjustment: x = 0.346 ± 0.02, y = 0.359 ± 0.02.)
2. Refer to the procedure for 9300K, section 6-3-2 (c) steps 2 and 3.

6-3-4 (d) WHITE BALANCE ADJUSTMENT VERIFICATION

Refer to the procedure for 9300K, section 6-4-2 (d).

6-3-5 Luminance Uniformity Check

Luminance is considered uniform only if the ratio of lowest to highest brightness areas on the screen is not less than 7.5:10.

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz (1024 x 768)
Display image:	White flat field
Display size	352 (H) x 264 (V) - 19” 306 (H) x 230 (V) - 17”
Brightness:	Cut off point
Contrast:	Maximum

PROCEDURE

Measure luminance at nine points on the display screen (see figure below).

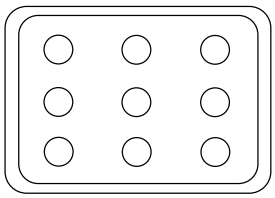


Figure 6-10 Luminance Uniformity Check Locations

6-3-6 Focus Adjustment

CONDITIONS

Scanning frequency:	68 kHz / 85 Hz
Display image:	“H” character pattern
Brightness:	Cut off point
Contrast:	Maximum

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

6-3-7 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

Orientation:	Monitor facing east
Scanning frequency:	68 kHz / 85 Hz
Display image:	White flat field
Luminance:	Cut off point at the center of the display area

Note: Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

For trained and experienced service technicians only.

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer (see Figure 6-11 and 6-12).
3. Make sure the spacing between the PCM assembly and the CRT stem is 29 mm ± 1 mm.
4. Display a green pattern over the entire display area.
5. Adjust the purity magnet rings on the PCM assembly to display a pure green pattern. (Optimum setting: x = 0.295 ± 0.015, y = 0.594 ± 0.015)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 6-3. Color Purity Tolerances

Red:	x = 0.640 ± 0.015	y = 0.323 ± 0.015
Green:	x = 0.295 ± 0.015	y = 0.594 ± 0.015
Blue:	x = 0.142 ± 0.015	y = 0.066 ± 0.015

(For 9300K color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02)

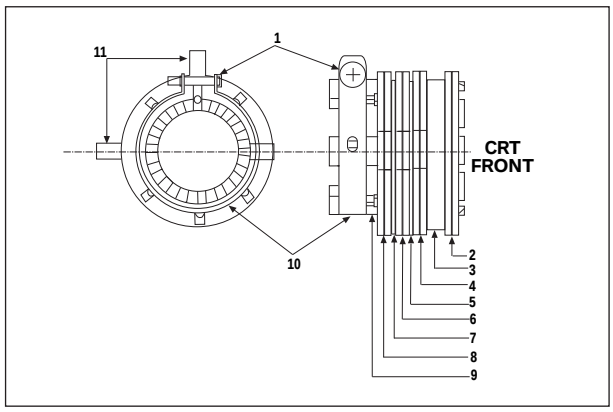
7. When you have the PCMs properly adjusted, carefully glue them together to prevent their movement during shipping.

6-4 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multibeam CRT fail to meet the other beams at a specified point.

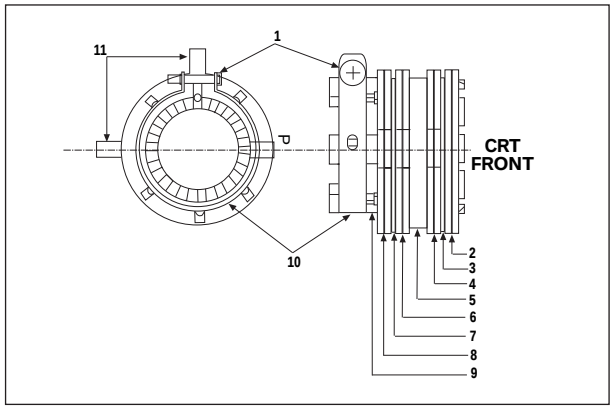
Table 6-4. Misconvergence Tolerances

Position	Error in mm	CRT Dot Pitch	REMARK
Center (A)	0.30	0.26	—
Edge (B)	0.50	0.26	< 1024 X 768
	0.4		≥ 1024 X 768



Samsung SDD and Hitachi CRT			
1 Setup Bolt	2 Bow Magnet	3 Band	4 2-Pole Magnet
5 Spacer	6 4-Pole Magnet	7 Spacer	8 6-Pole Magnet
9 Holder	10 Band	11 Tabs	

Figure 6-11. Magnet Configuration



Toshiba CRT			
1 Setup Bolt	2 Bow Magnet	3 Spacer	4 2-Pole Magnet
5 Band	6 6-Pole Magnet	7 Spacer	8 4-Pole Magnet
9 Holder	10 Band	11 Tabs	

Figure 6-12. Toshiba Magnet Configuration

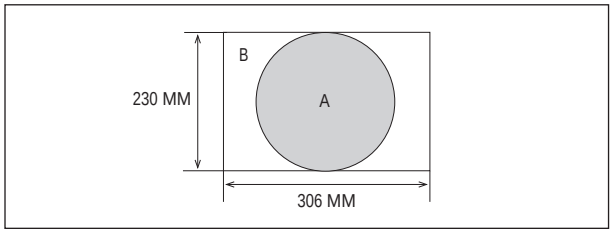


Figure 6-13. Convergence Measurement Areas

6-4-1 Static (Center) Convergence

Static convergence involves alignment of the red, blue and green lines in the center area of the display. See “Dynamic Convergence” for alignment of the color fields around the edges of the display.

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 6-5

PROCEDURE

As shown in Figure 6-11 and 6-12, the CRT used in these monitors has the same magnet configuration as shown in Table 6-6 below.

Table 6-5. Magnet Order

CRT Manufacturer	Magnet Order from Front of CRT
SDD and Hitachi	Convergence bow, 2-pole, 4-pole, 6-pole
Toshiba	Convergence bow, 2-pole, 6-pole, 4-pole

Use the following steps to correct any static misconvergence:

1. Make sure the display is not affected by external magnetic fields.
2. Locate the pair of 4-pole magnet rings.
3. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
4. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue lines.

5. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
6. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
7. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don't rotate the 2-pole magnets as they adjust for color purity.
8. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

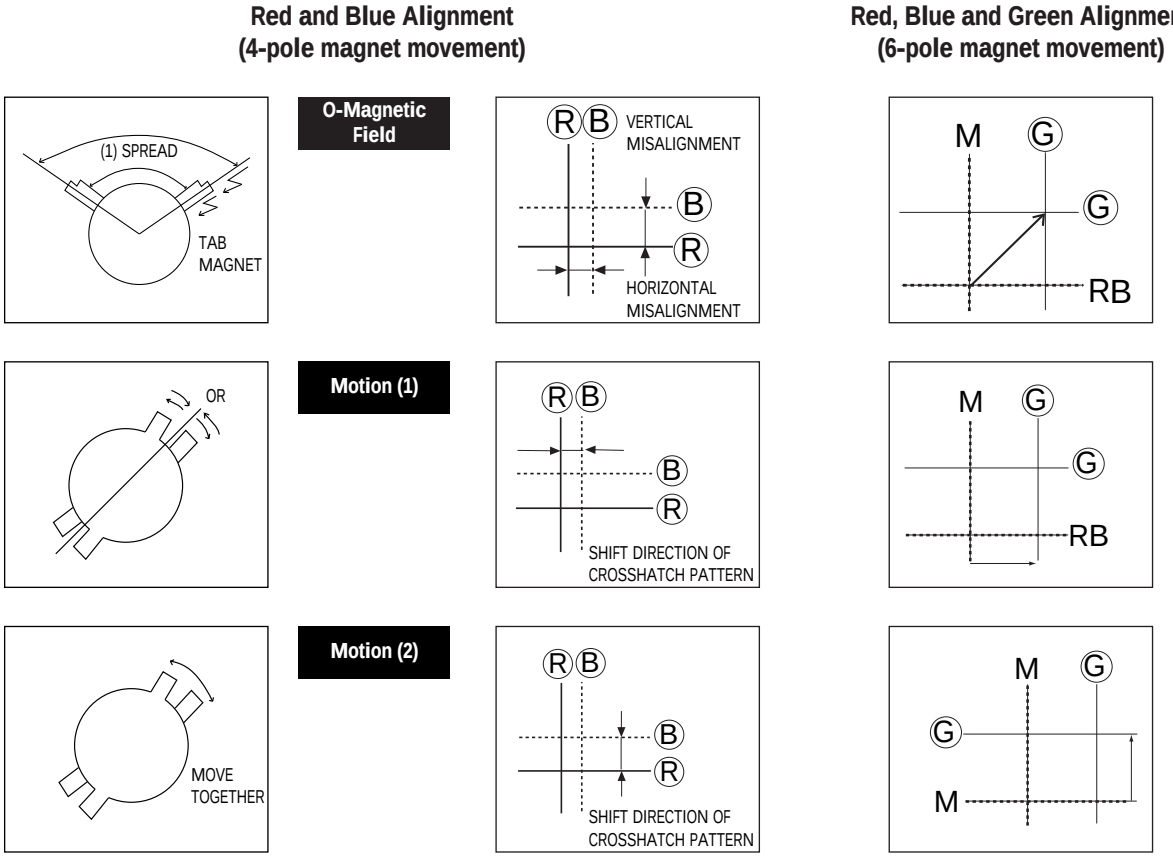
6-4-2 Dynamic (Edge) Convergence

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence around the periphery of the display area is still greater than the tolerance, contact the Regional After Service Center for possible CRT replacement.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small rubber magnets on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnets until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnets to the back of the CRT.

WARNING: Do not remove or change the position of the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT; their removal may result in damage to the CRT.

Figure 6-14. Magnet Movements



6-4-3 Bow Convergence Adjustments

CONDITIONS

Orientation: Monitor facing east.
Display Image: Crosshatch pattern with mixed RGB colors.
Required tools: Flat-head (–) screwdriver, 1.5 mm
Philips (+) screwdriver, 1.5 mm
Hexkey, 2.5 mm

PROCEDURE

Bow convergence adjustments are not available for the CRTs used in the CSH7839L / CSH9839L monitors. While all CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figures 6-11 and 6-12). If bow convergence adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 6-5: Misconvergence Tolerances.

6-4-4 Balance Convergence Adjustments

Balance Convergence involves alignment of red and blue lines when they are misaligned at one end more so than at the other end. The Deflection Yoke holds the balance coils which can correct balance misconvergences.

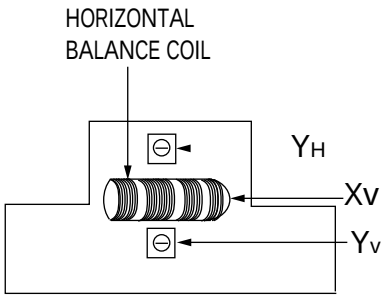


Figure 6-15. SDD and Hitachi Deflection Yoke

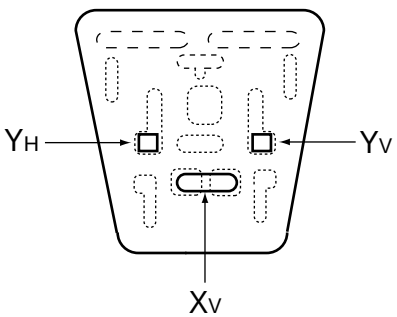


Figure 6-16. Toshiba Deflection Yoke

6-4-4 (a) HORIZONTAL LINE RED AND BLUE BALANCE CONVERGENCE

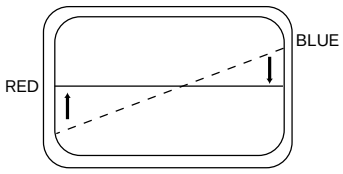


Figure 6-17. Horizontal Line Balance Misconvergence

Use a 2.5 mm hexkey at the Horizontal Balance Coil (XV). Turning it right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

6-4-4 (b) VERTICAL RED AND BLUE BALANCE CONVERGENCE

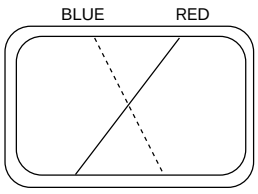


Figure 6-18. Vertical Line Balance Misconvergence

Use a 1.5 mm screwdriver (flat-head [–] for SDD DYs and phillips type [+] for Toshiba DYs) at the YH variable register. Turning the VR left tilts the blue line to the right. Turning it right tilts the blue line to the left.

6-4-4 (c) UPPER AND LOWER HORIZONTAL LINE CONVERGENCE

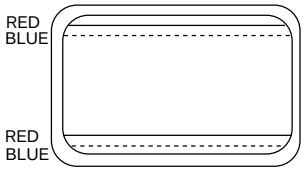


Figure 6-19. Upper and Lower Balance Misconvergence

Use a 1.5 mm screwdriver (flat-head [–] for SDD DYs and phillips type [+] for Toshiba DYs) at the Yv variable register. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it right moves the blue line at the top downward and at the bottom, the line moves upward.

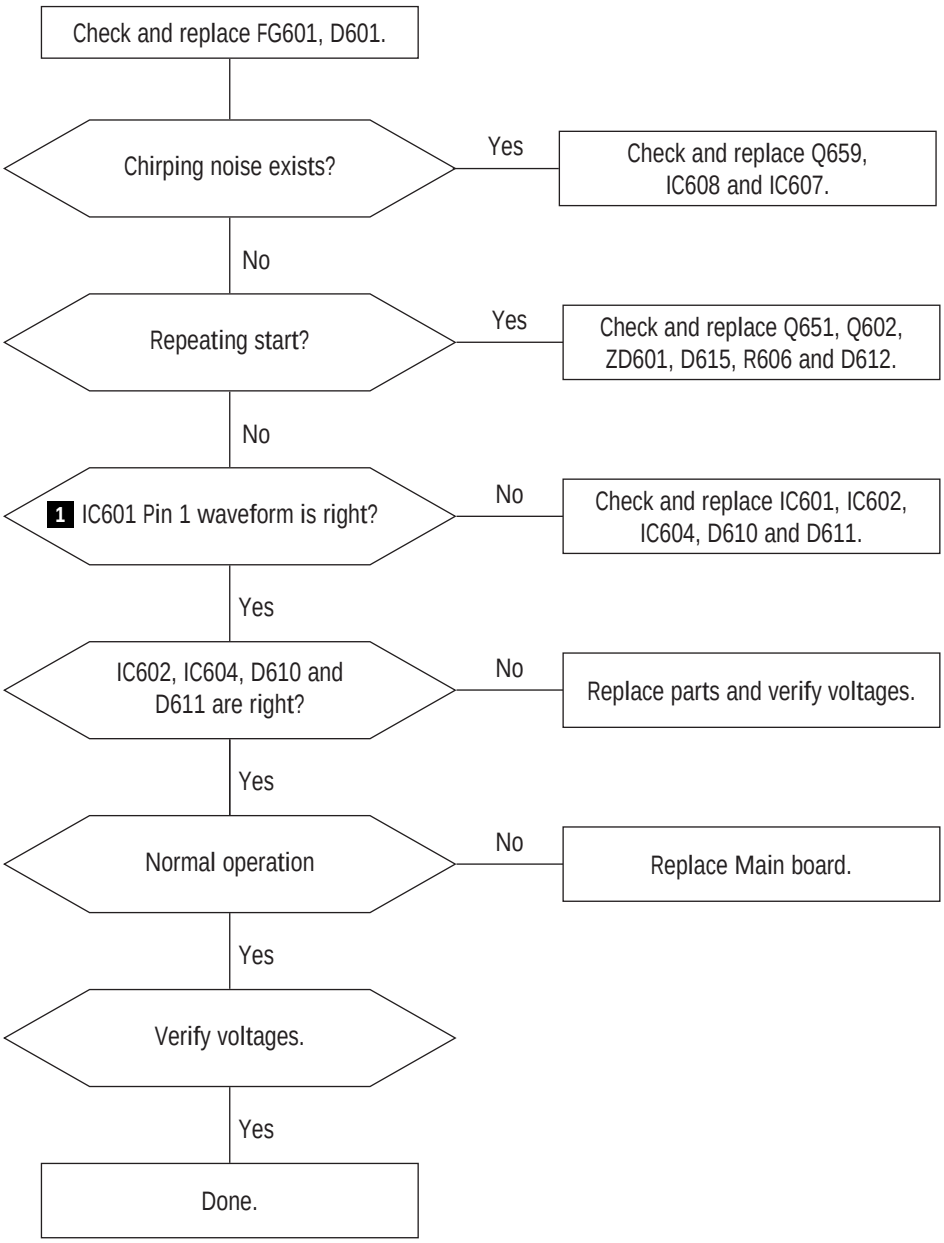
7 Troubleshooting

7-1 Parts Level Troubleshooting

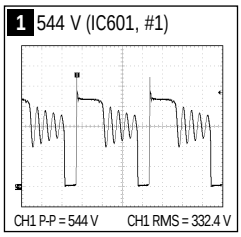
Notes: 1. If a picture does not appear, fully rotate the brightness and contrast controls clockwise and reinspect.

2. Check the following circuits.
   - No raster appears: Power circuit, Horizontal output circuit, H/V control circuit, and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

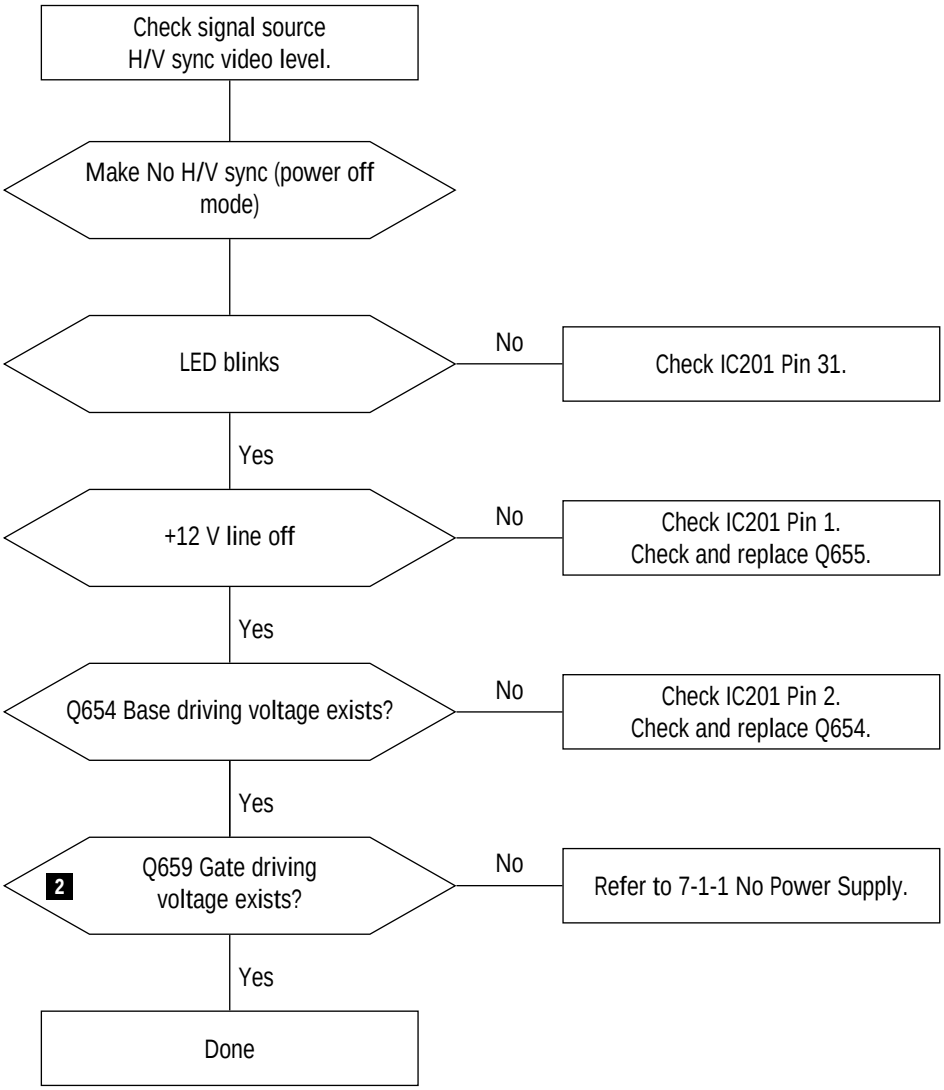
7-1-1 No Power Supply



WAVEFORMS

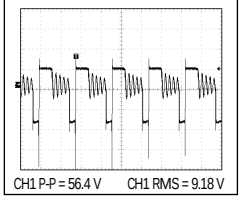


7-1-2 DPMS Failure

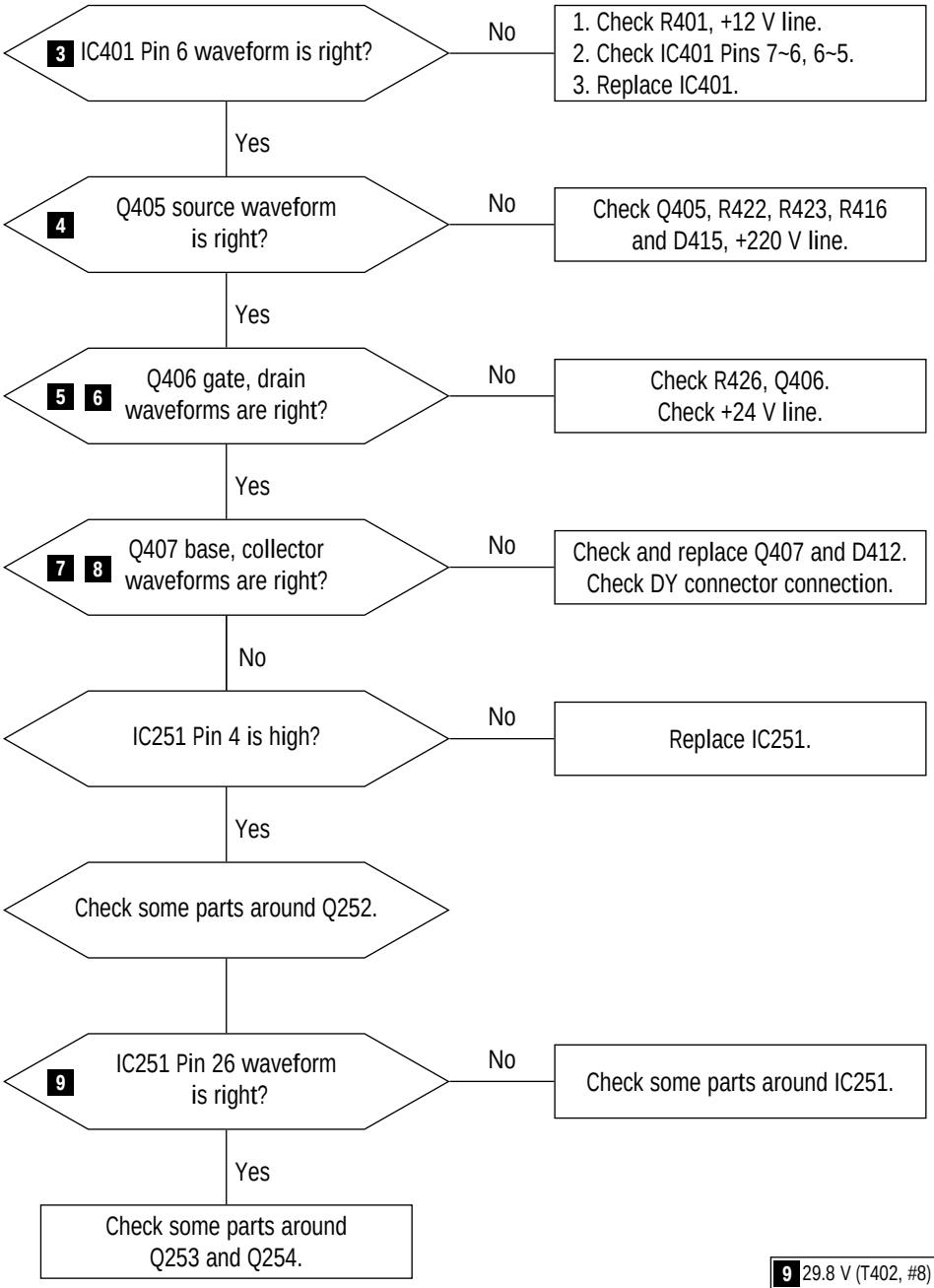


WAVEFORMS

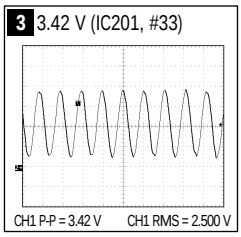
2 56.4 V (T601, #7)

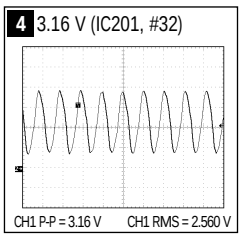


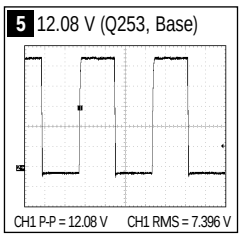
7-1-3 H_Deflection Failure

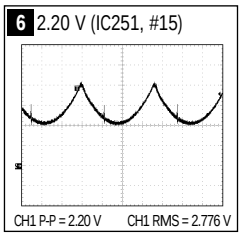

3 IC401 Pin 6 waveform is right?
No
1. Check R401, +12 V line.
2. Check IC401 Pins 7~6, 6~5.
3. Replace IC401.
Yes
4 Q405 source waveform is right?
No
Check Q405, R422, R423, R416 and D415, +220 V line.
Yes
5 6 Q406 gate, drain waveforms are right?
No
Check R426, Q406. Check +24 V line.
Yes
7 8 Q407 base, collector waveforms are right?
No
Check and replace Q407 and D412. Check DY connector connection.
No
IC251 Pin 4 is high?
No
Replace IC251.
Yes
Check some parts around Q252.
9 IC251 Pin 26 waveform is right?
No
Check some parts around IC251.
Yes
Check some parts around Q253 and Q254.

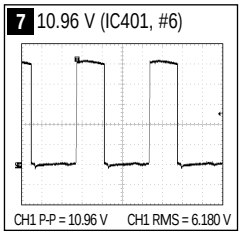
WAVEFORMS

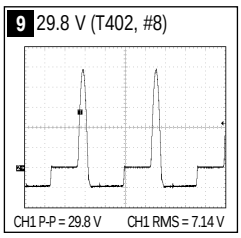


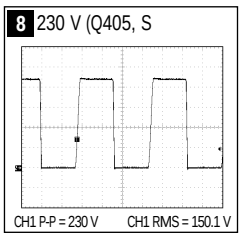




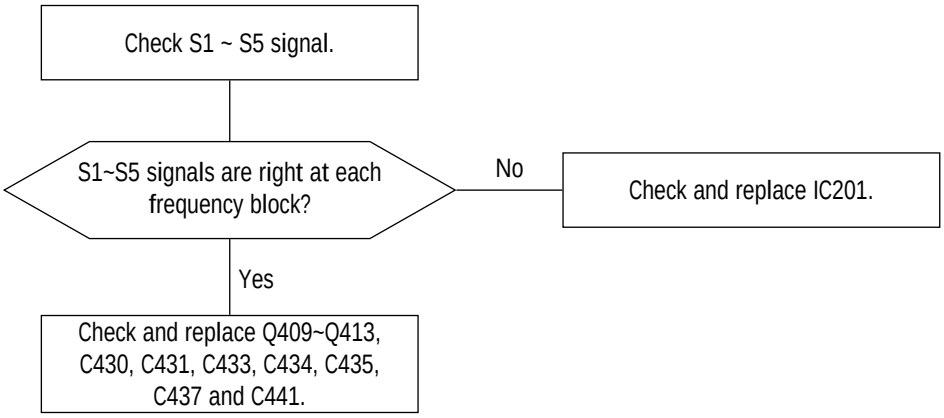




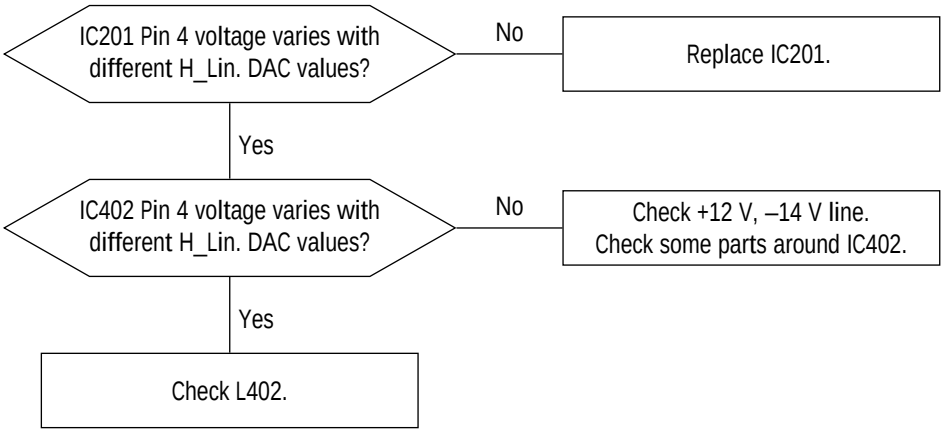




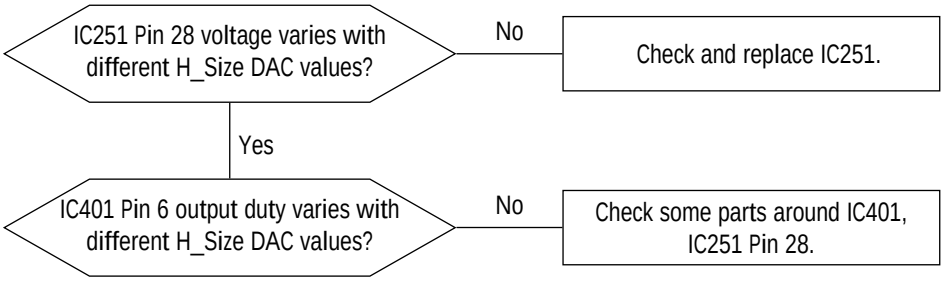
7-1-4 S Correction Failure


Check S1 ~ S5 signal.
S1~S5 signals are right at each frequency block?
No
Check and replace IC201.
Yes
Check and replace Q409~Q413, C430, C431, C433, C434, C435, C437 and C441.

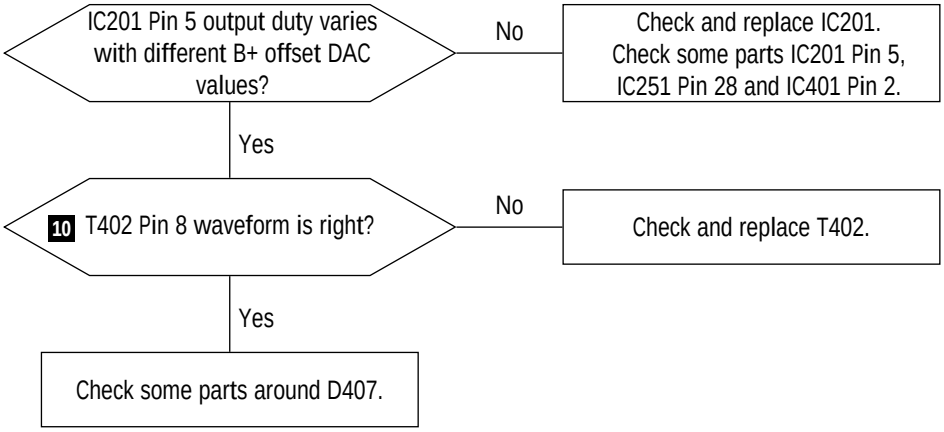
7-1-5 H_Lin. Failure


IC201 Pin 4 voltage varies with different H_Lin. DAC values?
No
Replace IC201.
Yes
IC402 Pin 4 voltage varies with different H_Lin. DAC values?
No
Check +12 V, –14 V line. Check some parts around IC402.
Yes
Check L402.

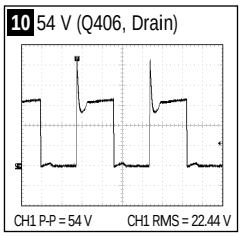
7-1-6 Invariable H_Size


IC251 Pin 28 voltage varies with different H_Size DAC values?
No
Check and replace IC251.
Yes
IC401 Pin 6 output duty varies with different H_Size DAC values?
No
Check some parts around IC401, IC251 Pin 28.

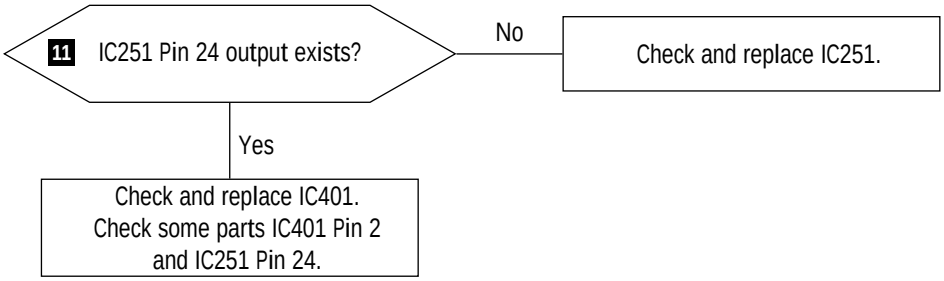
7-1-7 Abnormal H_Size


IC201 Pin 5 output duty varies with different B+ offset DAC values?
No
Check and replace IC201. Check some parts IC201 Pin 5, IC251 Pin 28 and IC401 Pin 2.
Yes
10 T402 Pin 8 waveform is right?
No
Check and replace T402.
Yes
Check some parts around D407.

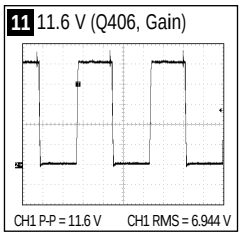
WAVEFORMS



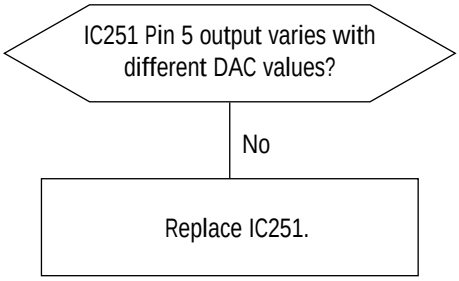
7-1-8 Side Pin or Trap Failure


11 IC251 Pin 24 output exists?
No
Check and replace IC251.
Yes
Check and replace IC401. Check some parts IC401 Pin 2 and IC251 Pin 24.

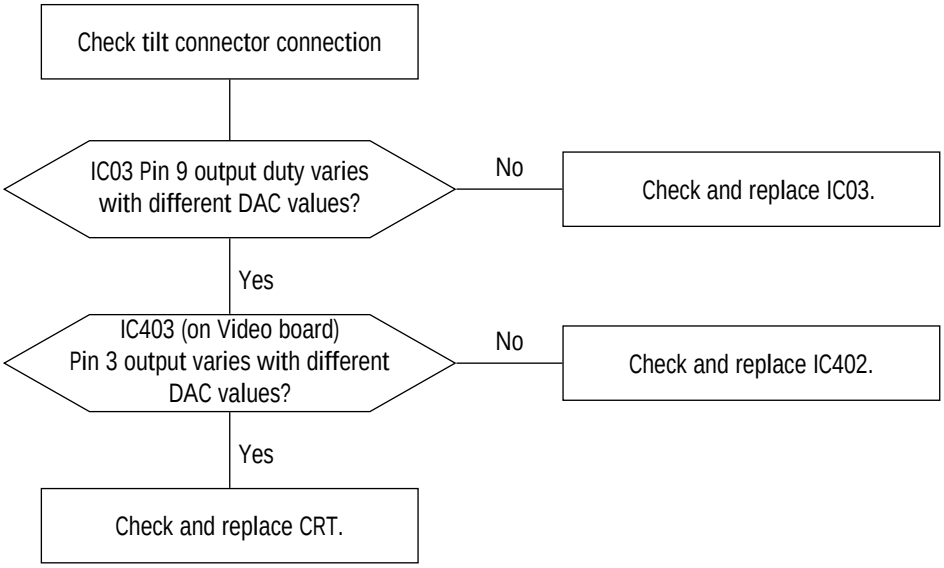
WAVEFORMS



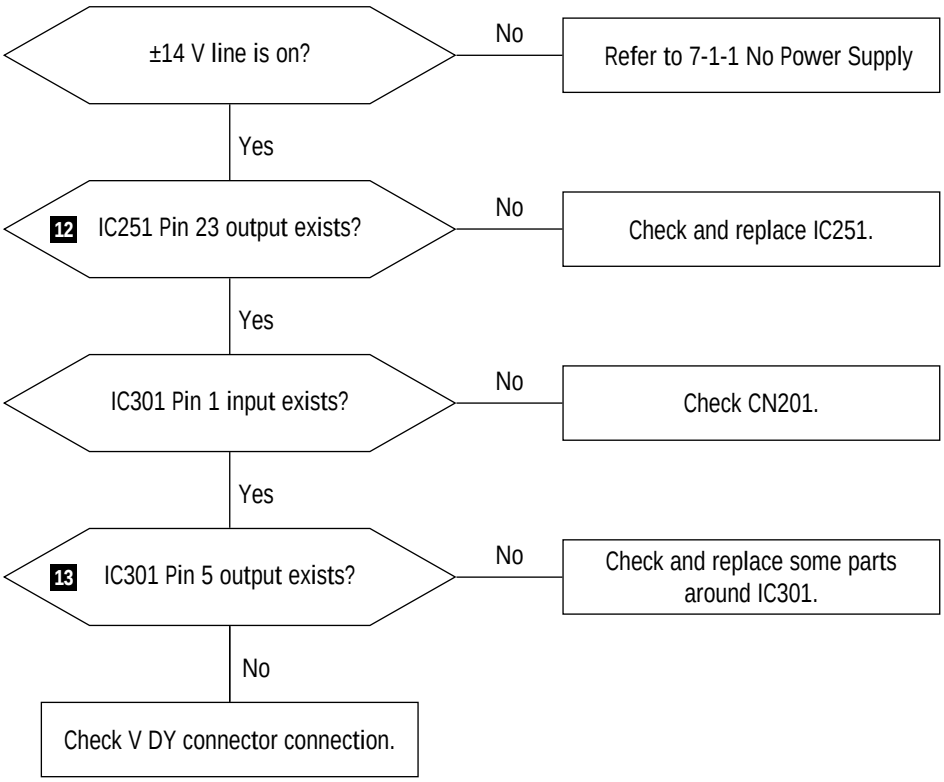
7-1-9 Para. or Pin Balance Failure



7-1-10 Tilt Failure

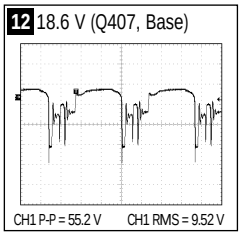

Check tilt connector connection
IC03 Pin 9 output duty varies with different DAC values?
No
Check and replace IC03.
Yes
IC403 (on Video board) Pin 3 output varies with different DAC values?
No
Check and replace IC402.
Yes
Check and replace CRT.

7-1-11 V Deflection Failure

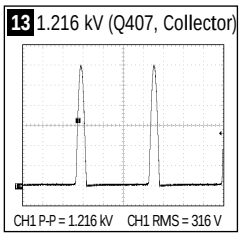


WAVEFORMS

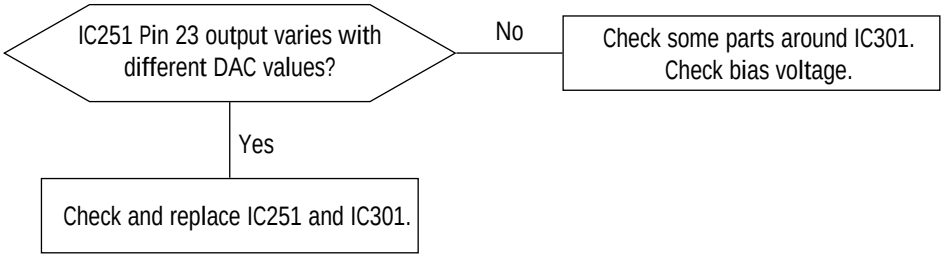
12 18.6 V (Q407, Base)



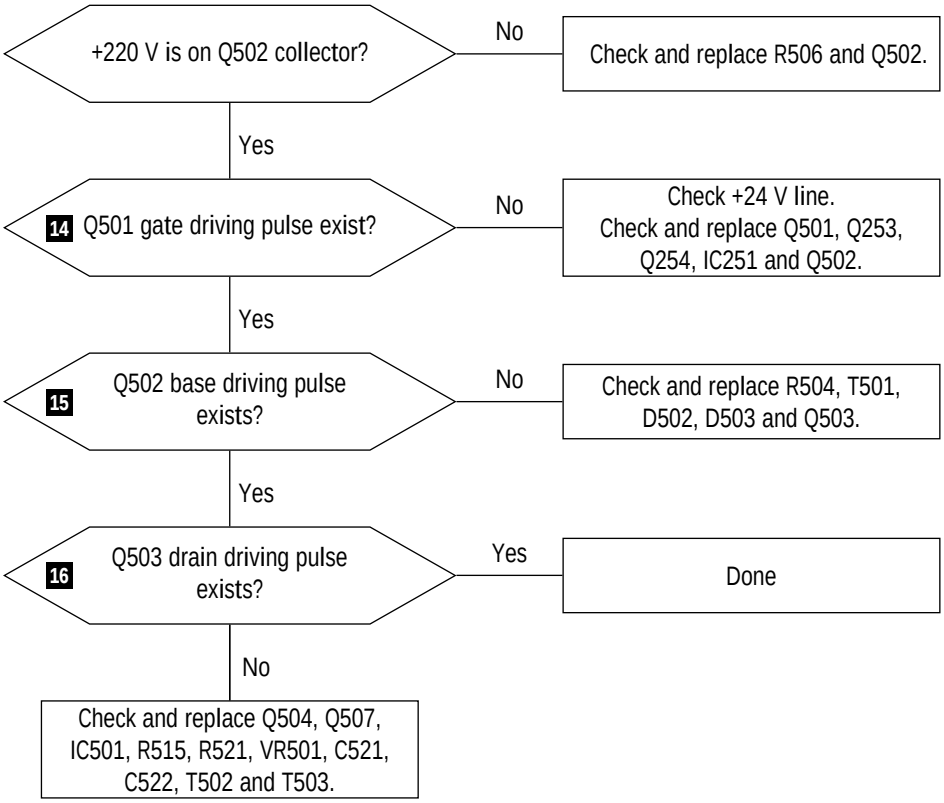
13 1.216 kV (Q407, Collector)



7-1-12 V Size or Pos. Variation Failure

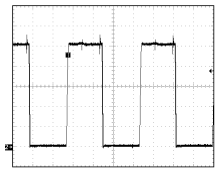

IC251 Pin 23 output varies with different DAC values?
No
Check some parts around IC301. Check bias voltage.
Yes
Check and replace IC251 and IC301.

7-1-13 High Voltage Failure

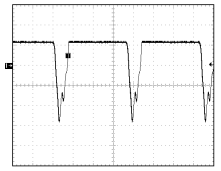

+220 V is on Q502 collector?
No
Check and replace R506 and Q502.
Yes
14 Q501 gate driving pulse exist?
No
Check +24 V line. Check and replace Q501, Q253, Q254, IC251 and Q502.
Yes
15 Q502 base driving pulse exists?
No
Check and replace R504, T501, D502, D503 and Q503.
Yes
16 Q503 drain driving pulse exists?
Yes
Done
No
Check and replace Q504, Q507, IC501, R515, R521, VR501, C521, C522, T502 and T503.

WAVEFORMS

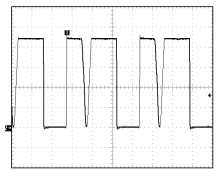
14 11.36 V (Q501, Gain)



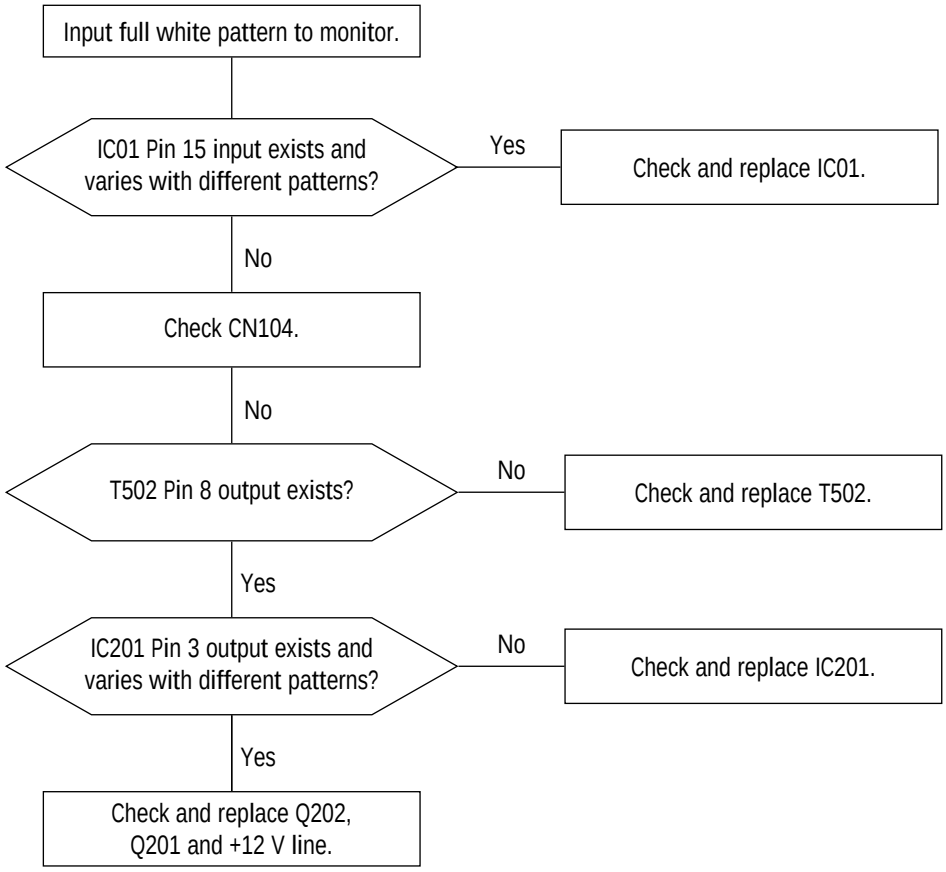
15 808 V (T501, #1)



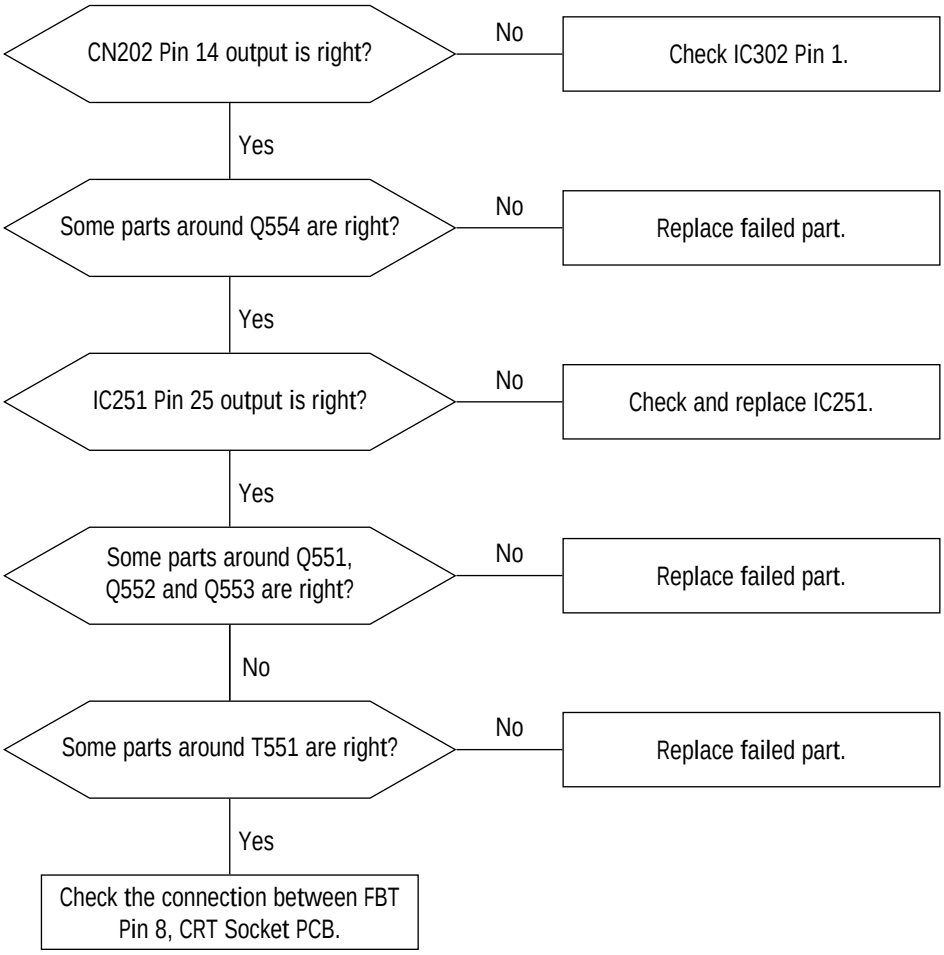
16 234 V (Q503, Drain)



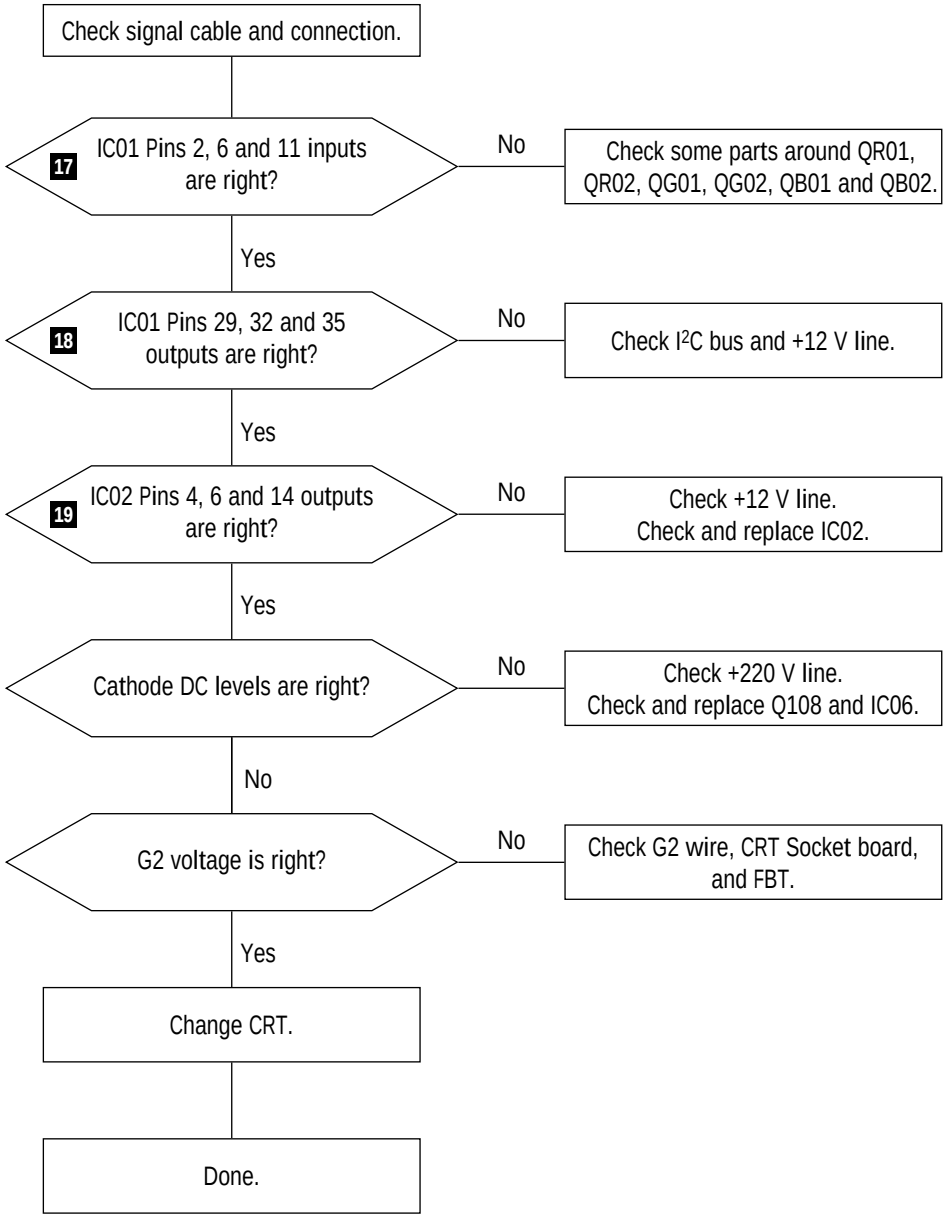
7-1-14 ABL Failure



7-1-15 Dynamic Focus Failure

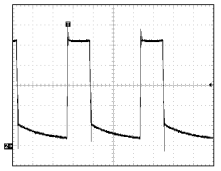


7-1-16 No Video

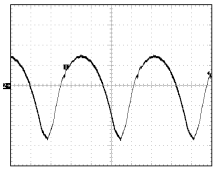

Check signal cable and connection.
17 IC01 Pins 2, 6 and 11 inputs are right?
No
Check some parts around QR01, QR02, QG01, QG02, QB01 and QB02.
Yes
18 IC01 Pins 29, 32 and 35 outputs are right?
No
Check I2C bus and +12 V line.
Yes
19 IC02 Pins 4, 6 and 14 outputs are right?
No
Check +12 V line.
Check and replace IC02.
Yes
Cathode DC levels are right?
No
Check +220 V line.
Check and replace Q108 and IC06.
No
G2 voltage is right?
No
Check G2 wire, CRT Socket board, and FBT.
Yes
Change CRT.
Done.

WAVEFORMS

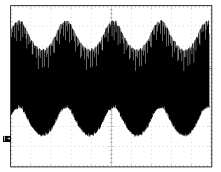
17 12.40 V (IC501, #9, 10)



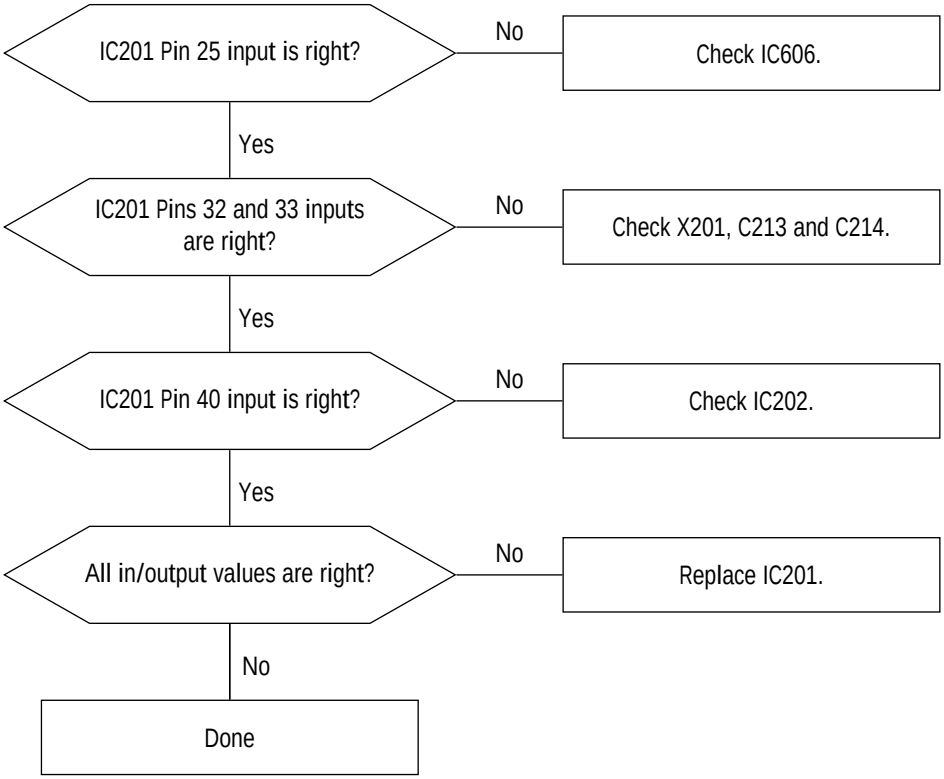
18 42.8 V (T551, #7)



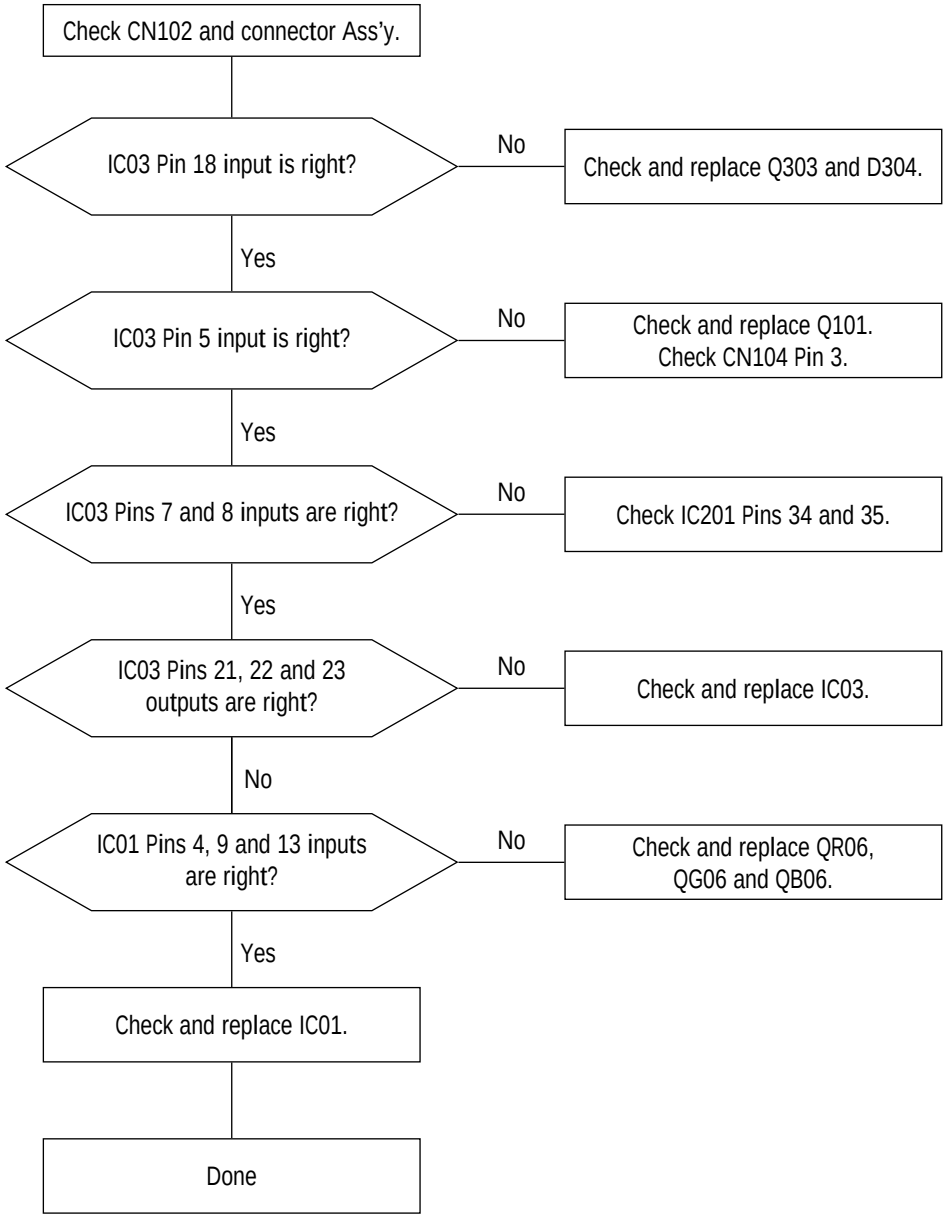
19 580 V (T551, #1)



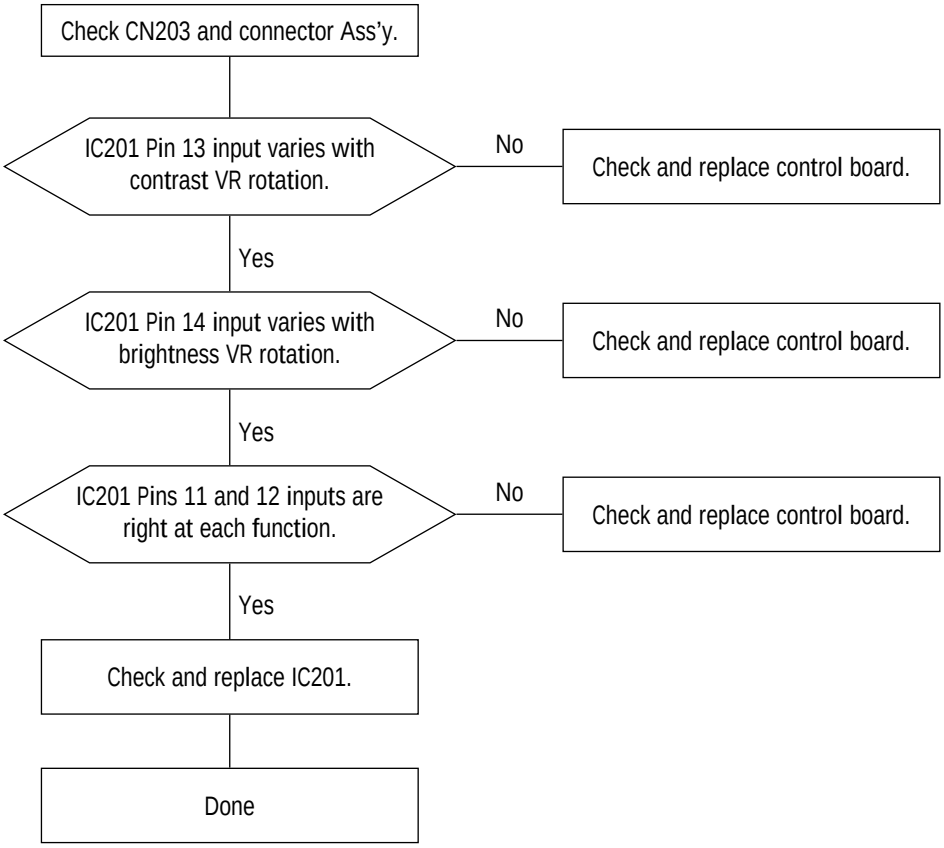
7-1-17 Micom Failure



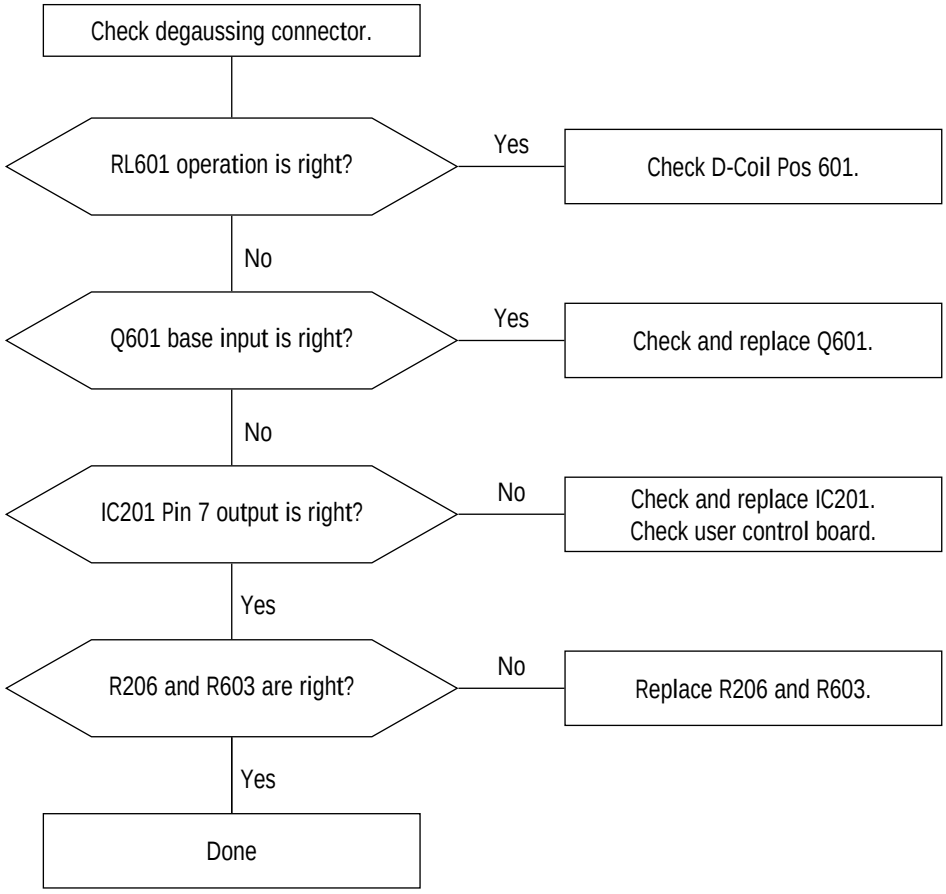
7-1-18 OSD Failure



7-1-19 User Control Failure

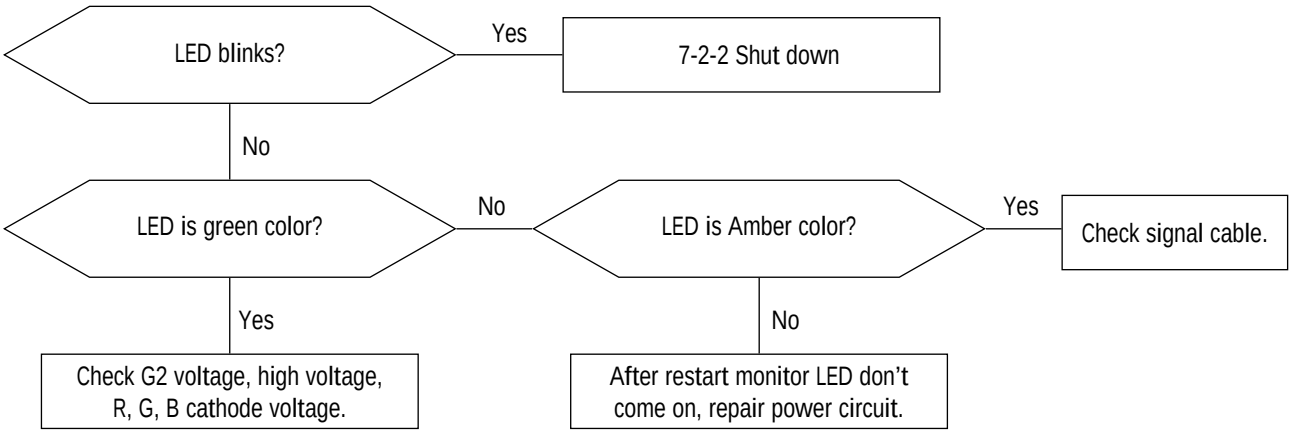

Check CN203 and connector Ass'y.
IC201 Pin 13 input varies with contrast VR rotation.
No
Check and replace control board.
Yes
IC201 Pin 14 input varies with brightness VR rotation.
No
Check and replace control board.
Yes
IC201 Pins 11 and 12 inputs are right at each function.
No
Check and replace control board.
Yes
Check and replace IC201.
Done

7-1-20 Degaussing Failure

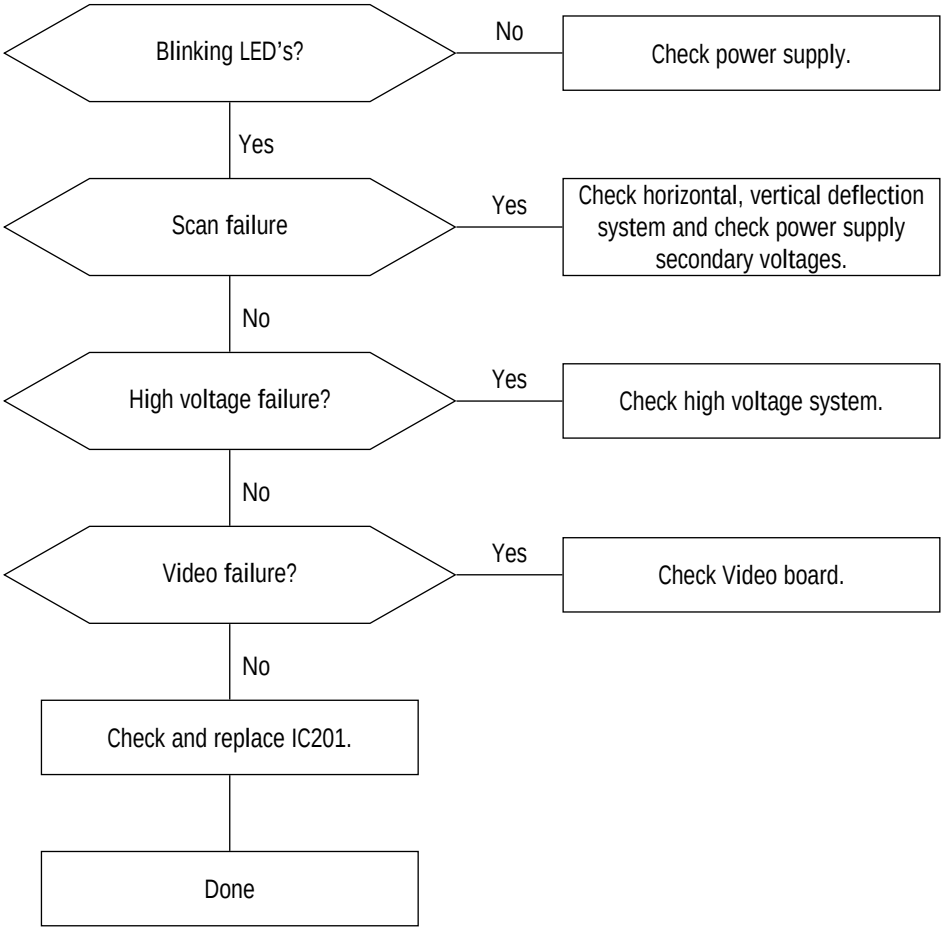


7-2 General Troubleshooting

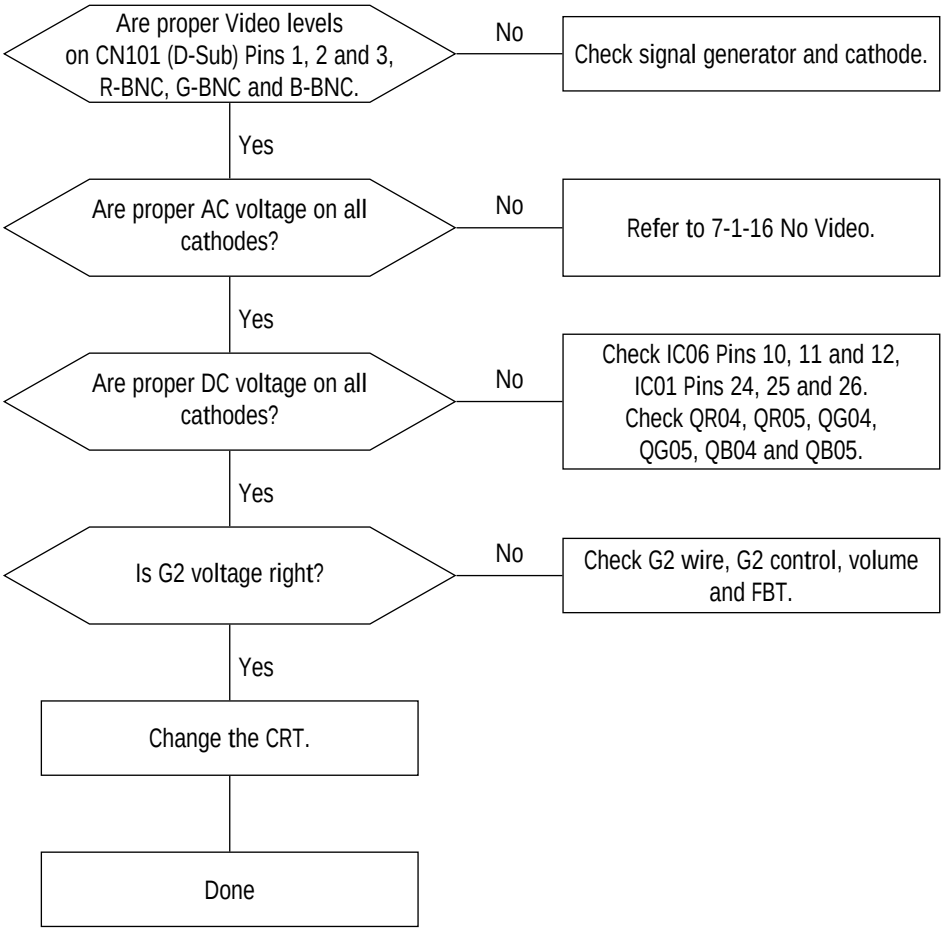
7-2-1 No Picture



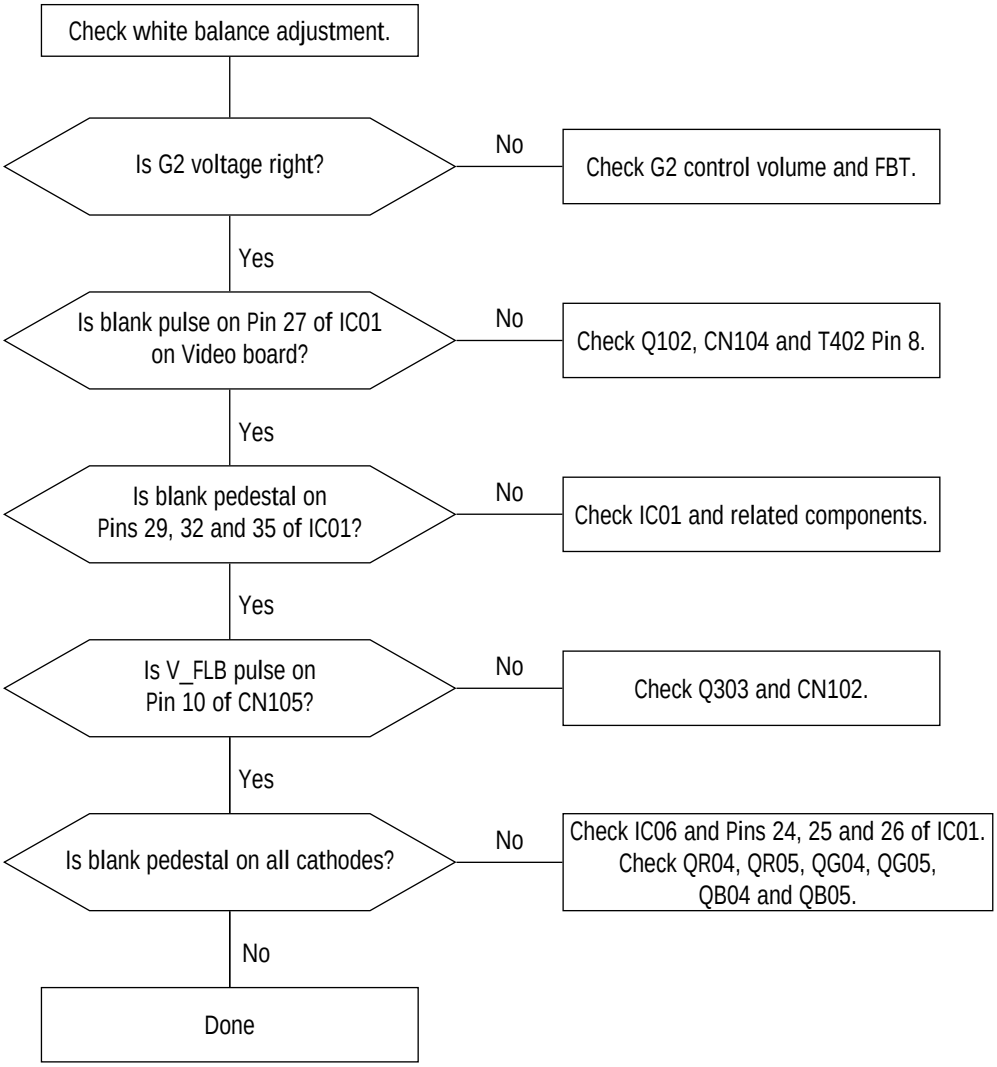
7-2-2 Shut Down



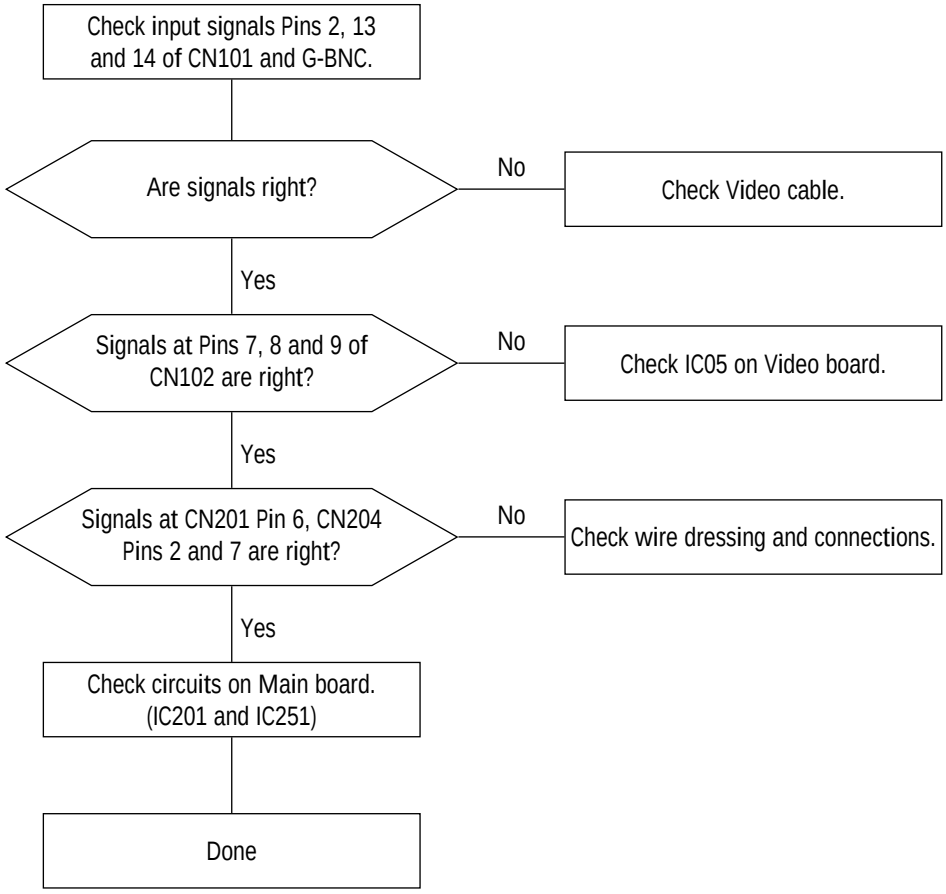
7-2-3 Missing Color


Are proper Video levels on CN101 (D-Sub) Pins 1, 2 and 3, R-BNC, G-BNC and B-BNC.
No
Check signal generator and cathode.
Yes
Are proper AC voltage on all cathodes?
No
Refer to 7-1-16 No Video.
Yes
Are proper DC voltage on all cathodes?
No
Check IC06 Pins 10, 11 and 12, IC01 Pins 24, 25 and 26. Check QR04, QR05, QG04, QG05, QB04 and QB05.
Yes
Is G2 voltage right?
No
Check G2 wire, G2 control, volume and FBT.
Yes
Change the CRT.
Done

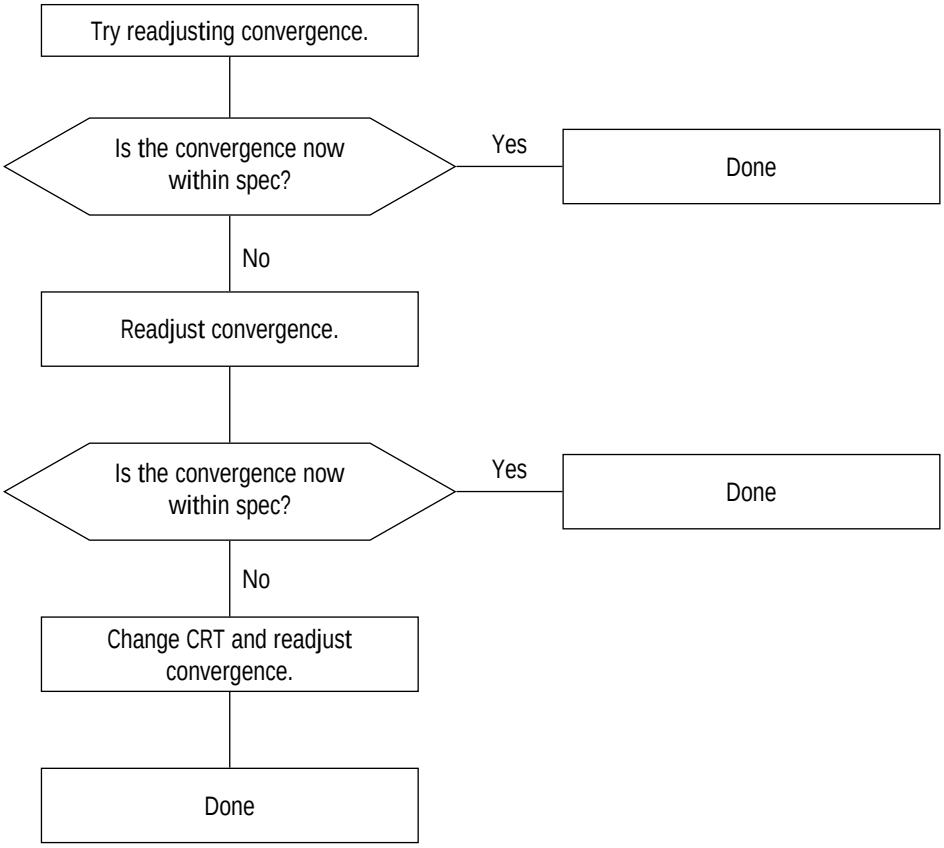
7-2-4 Visible Retrace


Check white balance adjustment.
Is G2 voltage right?
No
Check G2 control volume and FBT.
Yes
Is blank pulse on Pin 27 of IC01 on Video board?
No
Check Q102, CN104 and T402 Pin 8.
Yes
Is blank pedestal on Pins 29, 32 and 35 of IC01?
No
Check IC01 and related components.
Yes
Is V_FLB pulse on Pin 10 of CN105?
No
Check Q303 and CN102.
Yes
Is blank pedestal on all cathodes?
No
Check IC06 and Pins 24, 25 and 26 of IC01. Check QR04, QR05, QG04, QG05, QB04 and QB05.
No
Done

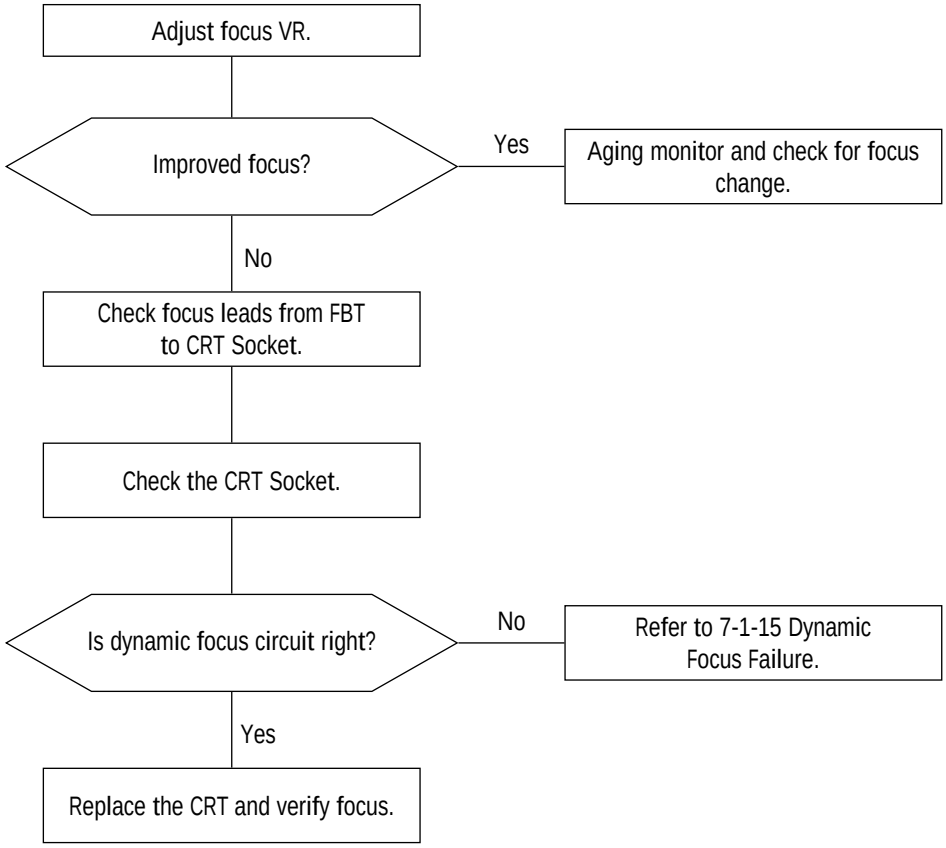
7-2-5 Unsynchronized Image


Check input signals Pins 2, 13 and 14 of CN101 and G-BNC.
Are signals right?
No
Check Video cable.
Yes
Signals at Pins 7, 8 and 9 of CN102 are right?
No
Check IC05 on Video board.
Yes
Signals at CN201 Pin 6, CN204 Pins 2 and 7 are right?
No
Check wire dressing and connections.
Yes
Check circuits on Main board. (IC201 and IC251)
Done

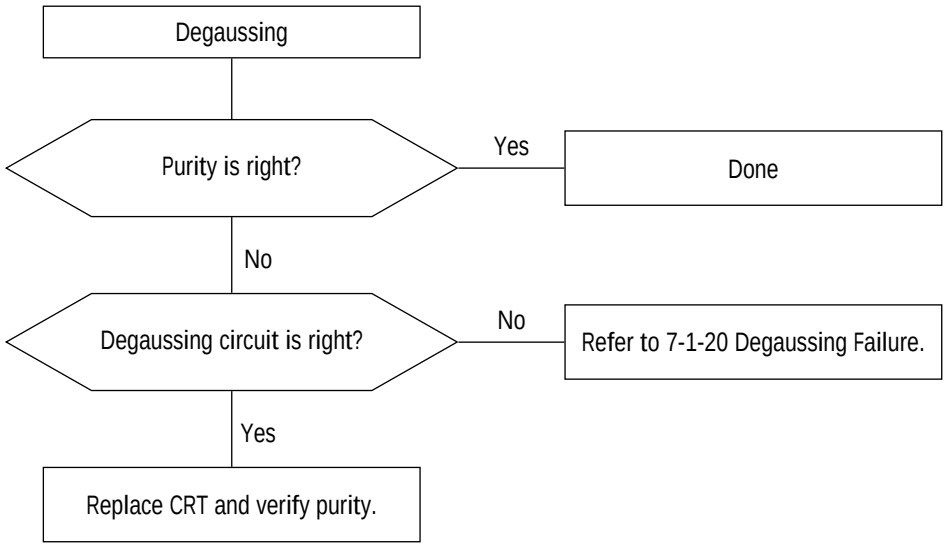
7-2-6 Misconvergence



7-2-7 Poor Focus



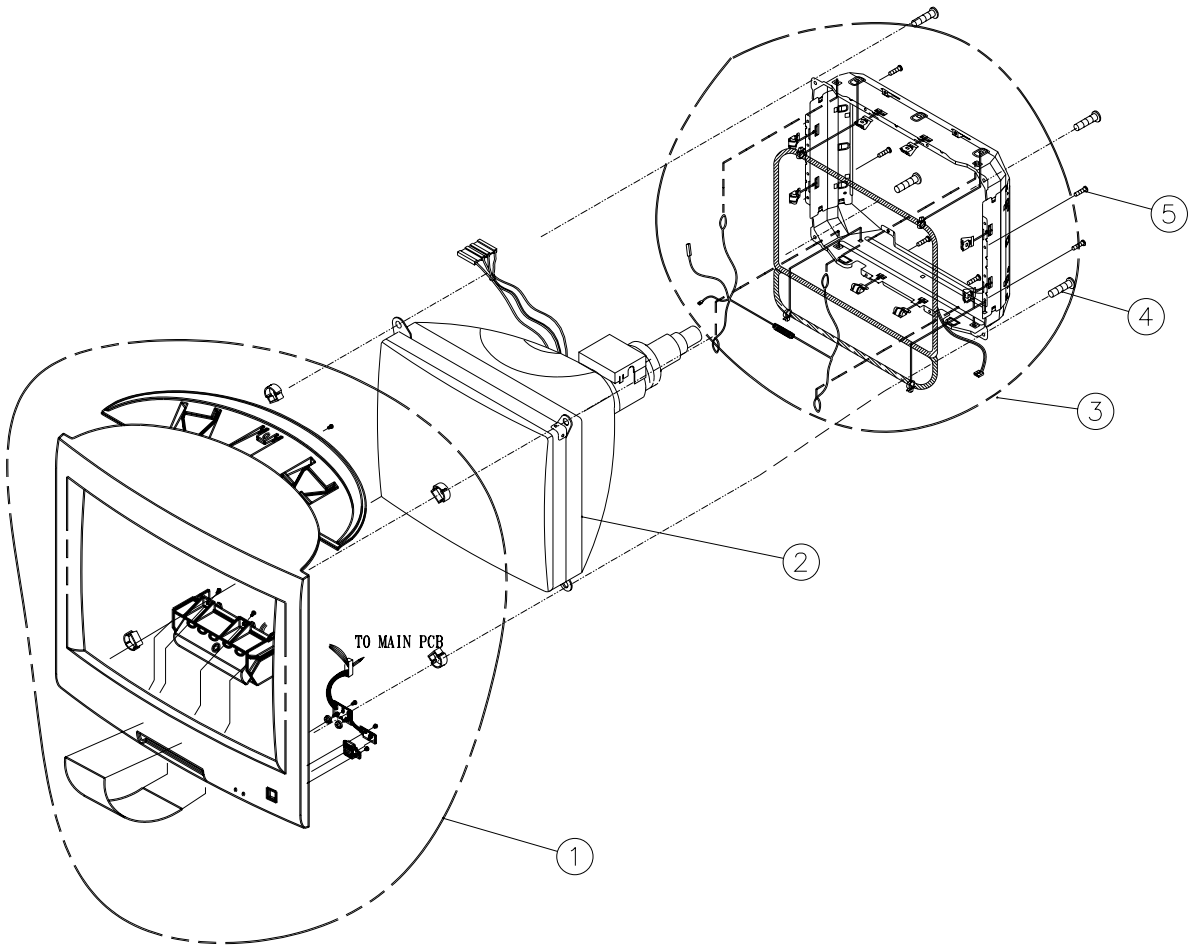
7-2-8 Purity Failure



8 Exploded View and Parts List

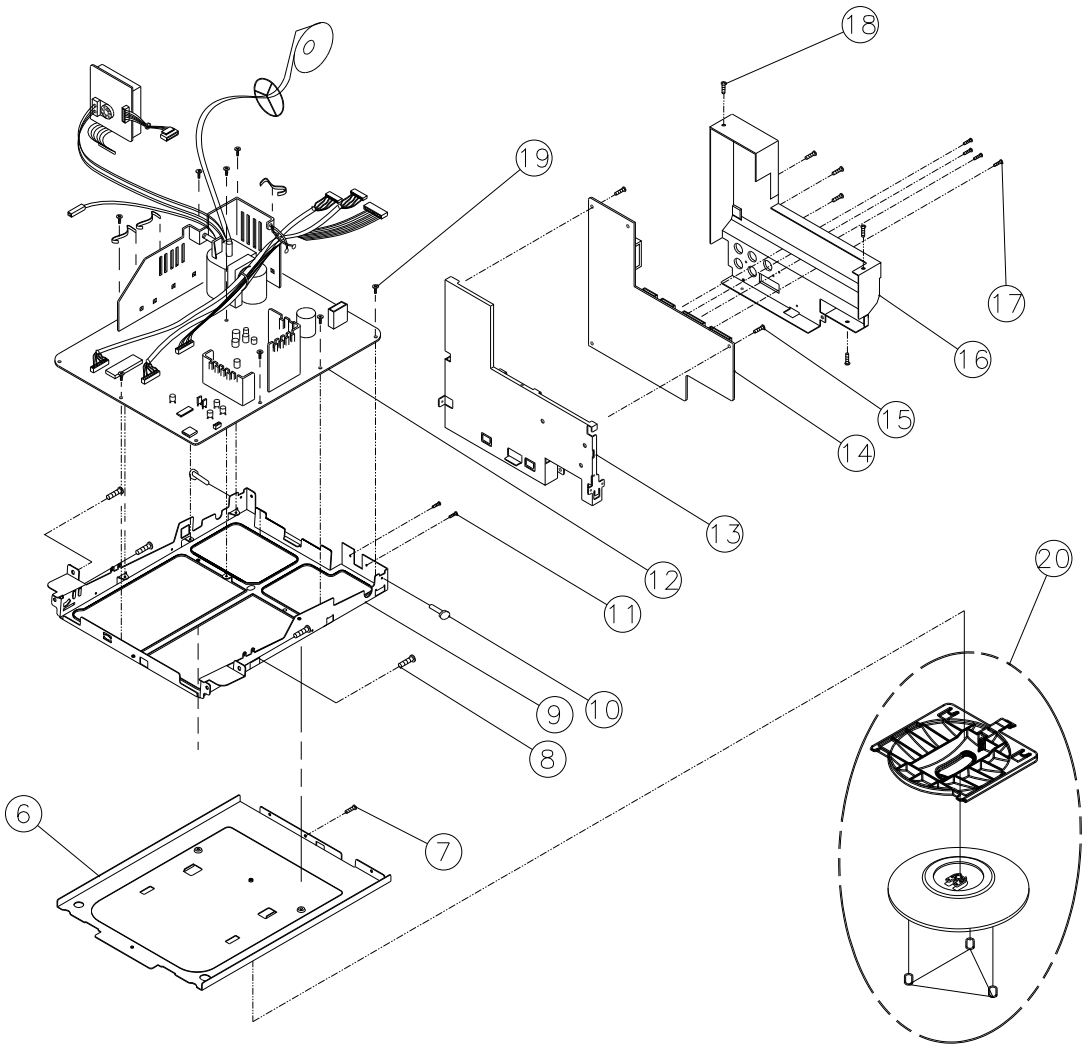
8-1 Front Cover & CRT Ass'y (CSH7839L)

NO	DESCRIPTION	CODE-NO	SPECIFICATION	Q'TY	REMARK
1	UNIT-COVER FRONT	BH75-10654A	ABS HB IV16	1	
2	CDT		17" CDT	1	
3	UNIT-BRKT-CDT	BH75-10657B	SECC T1.0	1	
4	SCREW-ASSY	6006-001010	CRT 5 X 25	4	
5	SCREW-TAPTITE	6006-000009	BH 4 X 16	6	



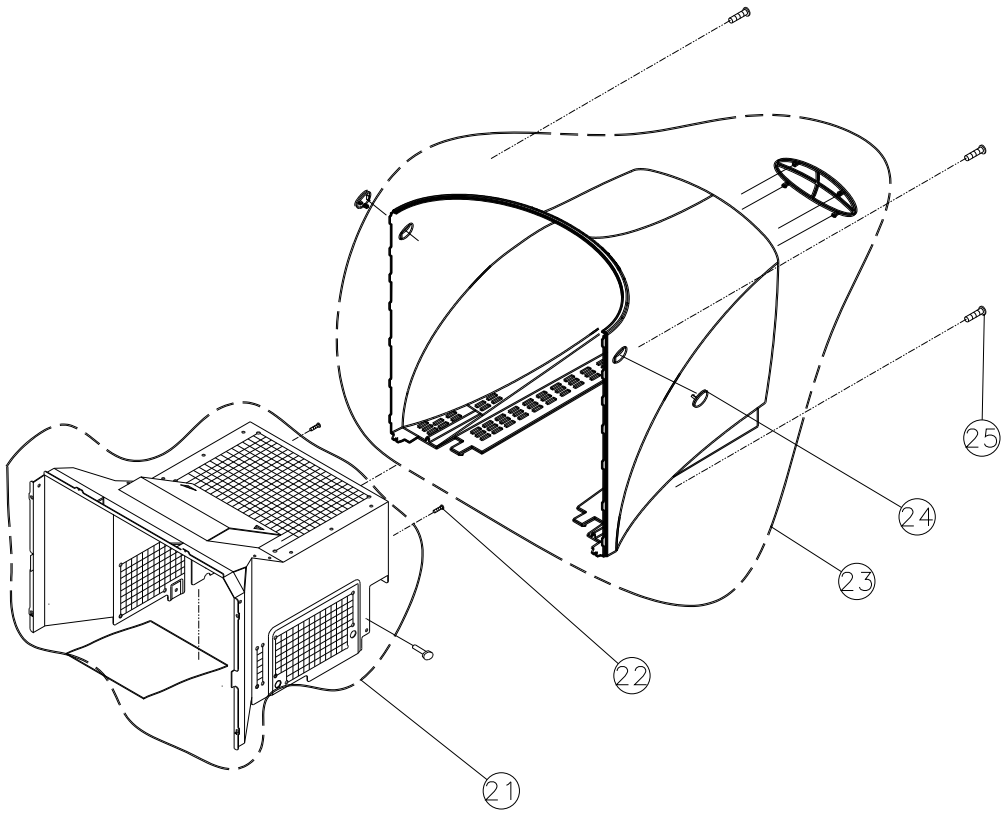
8-2 Chassis & Stand Ass'y (CSH7839L)

NO	DESCRIPTION	CODE-NO	SPECIFICATION	Q'TY	REMARK
6	BRKT-BOTTOM	BH70-10497A	SECC T1.0	1	
7	SCREW-TAPTITE	6003-00001	W/W 3 X 10	1	
8	SCREW-TAPTITE	6003-000009	BH 4 X 16	2	
9	BRKT/MAIN-PCB	BH70-10495B	SECC T1.0	1	
10	SCREW-TAPTITE	6003-000010	W/W 3 X 10	2	
11	SCREW-TAPPING	6002-000129	FH 3X8 BLK	2	
12	MAIN-PCB		CSH7839	1	
13	BRKT-VIDEO	BH70-10496A	SECC T1.0	1	
14	VIDEO-PCB		CSH7839	1	
15	SCREW-TAPTITE	6003-000010	W/W 3 X 10	3	
16	SHIELD-VIDEO	BH71-10394A	AL1050S T1.0	1	
17	SCREW-TAPTITE	6003-000010	W/W 3 X 10	6	
18	SCREW-TAPTITE	6003-000010	W/W 3 X 10	3	
19	SCREW-TAPTITE	6003-000010	W/W 3 X 10	5	
20	STAND-ASSY	BH75-10592A	ABS HB IV16	1	



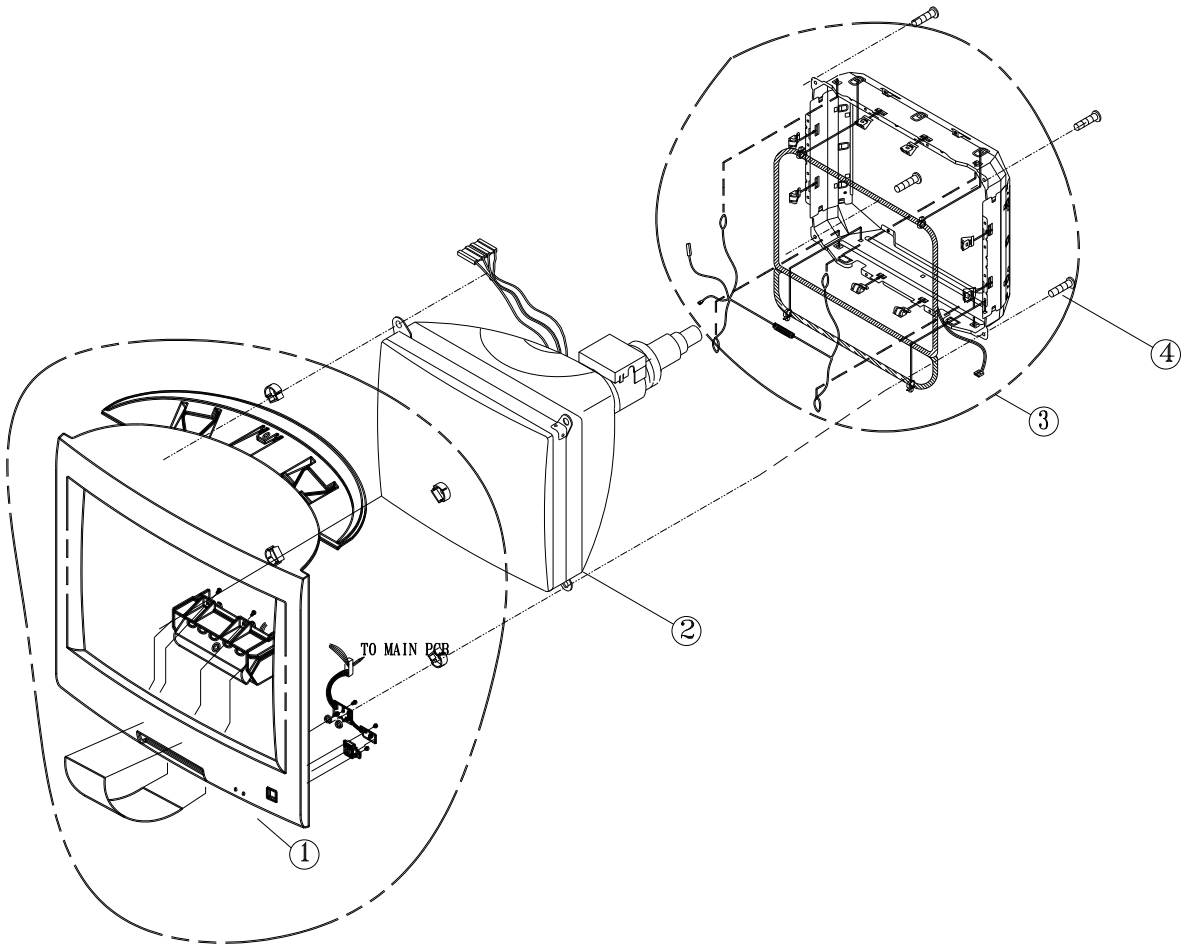
8-3 Rear Cover Ass'y (CSH7839L)

NO	DESCRIPTION	CODE-NO	SPECIFICATION	Q'TY	REMARK
21	UNIT/SHIELD-TOP	BH75-10587A	AL050S T0.5	1	
22	SCREW-TAPTITE	6003-000010	W/W 3 X 10	4	
23	CAP-SCREW	BH72-60628A	ABS HB IV16	2	
24	UNIT-COVER/REAR	BH75-60622A	ABS HB IV16	1	
25	SCREW-TAPTITE	6003-000009	BH 4 X 16	4	



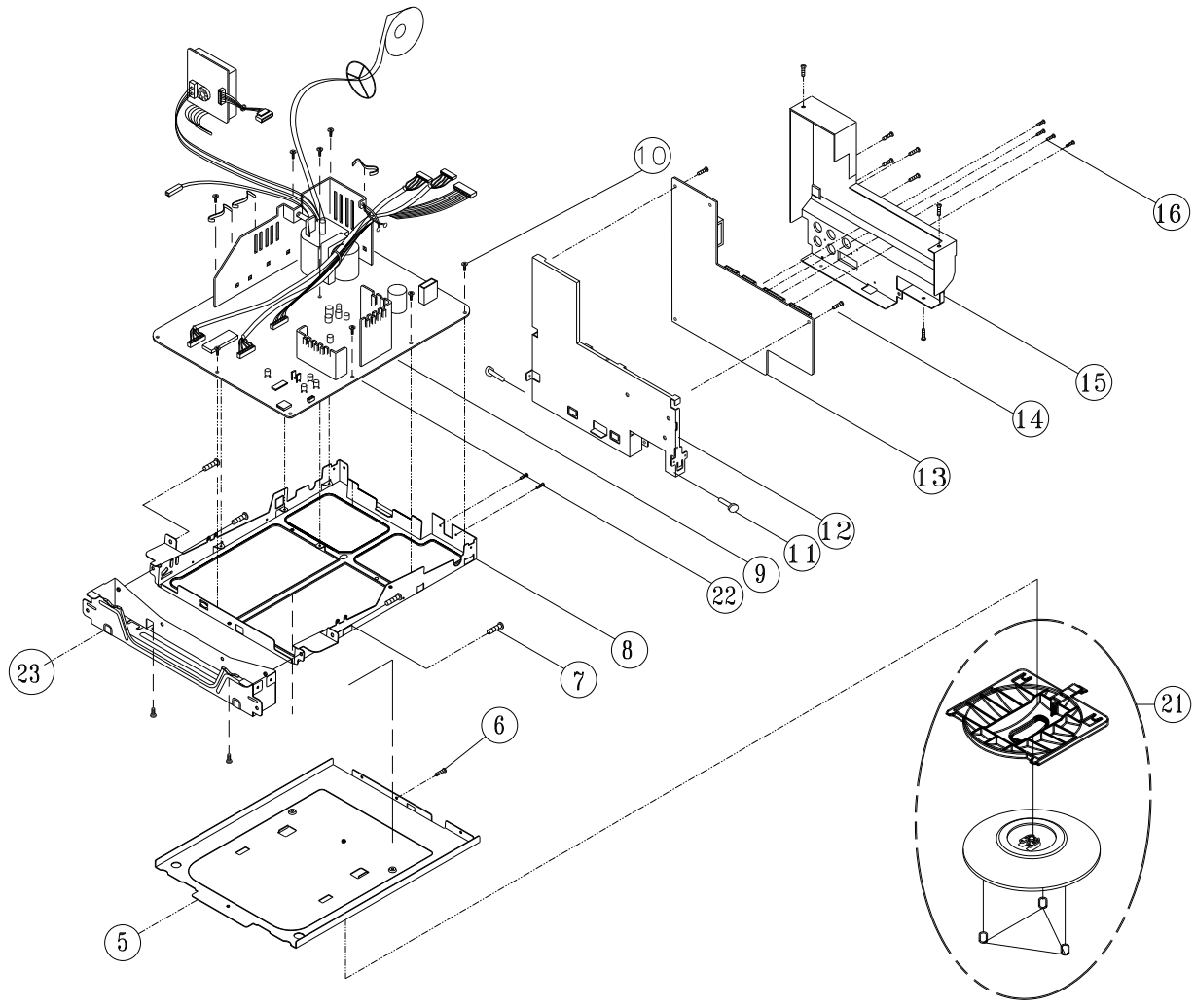
8-4 Front Cover & CRT Ass'y (CSH9839L)

NO	DESCRIPTION	CODE-NO	SPECIFICATION	Q'TY	REMARK
1	UNIT-COVER FRONT	BH75-10616A	ABS HB IV16	1	
2	CDT	BH03-10339S		1	
3	UNIT-BRKT-CDT	BH75-10655A	SECC T1.0	1	
4	SCREW	6006-001010	CRT 5 X 25	4	



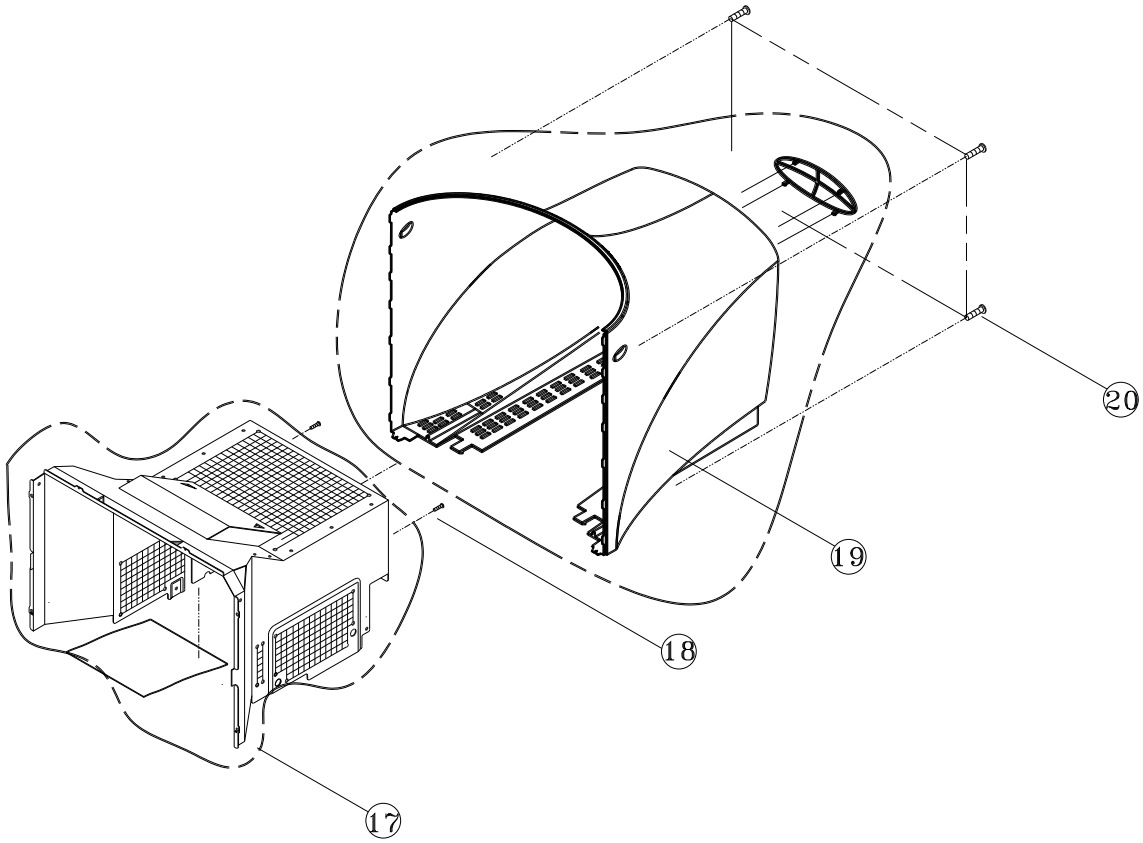
8-5 Chassis & Stand Ass'y (CSH9839L)

NO	DESCRIPTION	CODE-NO	SPECIFICATION	Q'TY	REMARK
5	BRKT-BOTTOM	BH70-10497A	SECC T1.0	1	
6	SCREW	6003-000010	TAPTITE W/W 3 X 10	1	
7	SCREW	6003-000009	TAPTITE BH 4 X 16	2	
8	BRKT/MAIN-PCB	BH70-10495A	SECC T1.0	1	
9	MAIN-PCB	BH98-10011K		1	
10	SCREW	6003-000010	TAPTITE W/W 3 X 10	5	
11	SCREW	6003-000010	TAPTITE W/W 3 X 10	1	
12	BRKT-VIDEO	BH70-10496A	SECC T1.0	1	
13	VIDEO-PCB	BH98-20003V		1	
14	SCREW	6003-000010	TAPTITE W/W 3 X 10	1	
15	SHIELD-VIDEO	BH71-10394A	AL1050S T1.0	1	
16	SCREW	6003-000010	TAPTITE W/W 3 X 10	1	
21	STAND-ASSY	BH75-10594A	ABS HB IV16	1	
22	SCREW	6002-000129	TAPTITE FH 3X8 BLK	2	
23	FRAME-BOTTOM	BH70-10504A	SECC T1.0	1	



8-6 Rear Cover Ass'y (CSH9839L)

17	UNIT/SHIELD-TOP	BH75-10589A	AL050S T0.5	1	
18	SCREW	6003-000010	TAPTITE W/W 3 X 10	2	
19	COVER-REAR	BH72-60638A	ABS HB IV16	1	
20	SCREW	6003-000009	TAPTITE BH 4 X 16	4	



9 Electrical Parts List

9-1 Main PCB Parts

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
BD201	128.2	205.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD202	19.6	263.9	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD203	24.7	268.6	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD204	71.4	301.7	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD205	68	281.2	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD299			3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD403	141.5	204.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD405	229.6	153.3	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD501	140.2	26	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD601	113	141.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD602	157.7	43.3	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD603	16.1	78.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD604	57.5	43.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD605	45.7	157	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD606	40.5	152.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD651	98.7	106.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD652	93	194	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD653	102.7	148.6	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD656	111.5	200.7	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
BD657	136	226.9	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10OHM	
C201	105.6	286.5	2201-000144	CAP-CERAMIC,101J,1H,NPO	100PF,50V,5%,NPOPPM,NPO,DISC-	
C202	79.2	301.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C203	76.4	301.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C204	79	289.4	2201-000326	C-CERAMIC,DISC	2.2nF,10%,50V,Y5P,6.3X3.0,5,TP	
C205	84.3	300.1	2401-000028	(T)50V10M	CAP-AL.ELEC,106M,1H	
C206	85.6	312.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C207	138.5	306.4	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C208	139.5	301.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C209	138.5	296.4	2401-000028	(T)50V10M	CAP-AL.ELEC,106M,1H	
C210	156.3	310.4	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C211	163.2	306.8	2401-000028	(T)50V10M	CAP-AL.ELEC,106M,1H	
C212	134.2	268.9	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C213	136.4	280.2	2201-000423	C-CERAMIC,DISC	27pF,5%,50V,NPO,5.0x3.0,2.5mm	
C214	140.5	280.2	2201-000009	C-CERAMIC,DISC	22pF,5%,50V,NPO,4x3.5,5,TP	
C215	140.7	265.9	2201-000144	CAP-CERAMIC,101J,1H,NPO	100PF,50V,5%,NPOPPM,NPO,DISC-	
C216	88.7	312.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C217	188.5	282.2	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C218	171	311	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C219	92	291.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C251	24.2	277.8	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C252	26.2	282	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C253	29.8	270.4	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C254	30.5	273.7	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C255	43.3	264.1	2201-000009	C-CERAMIC,DISC	22pF,5%,50V,NPO,4x3.5,5,TP	
C256	39	264.1	2201-000009	C-CERAMIC,DISC	22pF,5%,50V,NPO,4x3.5,5,TP	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C257	12.5	292	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C258	26.8	300	2301-000168	C-FILM,PEF	150nF,5%,100V,11.5x19mm,7.5mm	
C259	28.1	305	2305-000001	C-FILM,MPEF	470nF,10%,63V,6.0X15.5X7.5,5mm	
C260	34.3	310.9	2202-000003	C-CERAMIC,MLC-RADIAL	680pF,0.02,100V,NPO,5.1x5.1x3.	
C261	50.2	310.8	2305-000280	C-FILM,MPEF	220nF,10%,63V,7.5x13.5mm,5mm,T	
C262	45.1	296.9	2301-000016	C-FILM,PEF	22nF,5%,100V,7.2x4.5x9.0mm,5mm	
C263	57.5	289.9	2401-000027	C-AL	4.7uF,20%,50V,GP,5x11mm,5mm,TP	
C264	51.3	290.3	2202-000003	C-CERAMIC,MLC-RADIAL	680pF,0.02,100V,NPO,5.1x5.1x3.	
C265	46.3	282.7	2301-000016	C-FILM,PEF	22nF,5%,100V,7.2x4.5x9.0mm,5mm	
C266	44.2	277.4	2301-000231	C-FILM,PEF	3.3nF,5%,100V,5.8x12.5mm,5mm,T	
C267	51.8	306.1	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C268	21.4	310	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C269	46.3	286.6	2202-000321	C-CERAMIC,MLC-RADIAL	100nF,10%,50V,X7R,5.1x6.6,5.1	
C270	13.8	284.2	2401-001016	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	
C271	51.8	299.5	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C272	60.5	301.1	2201-000215	C-CERAMIC,DISC	120pF,5%,50V,NPO,10.0X4.0,5,TP	
C273	182.1	296.3	2201-000111	C-CERAMIC,DISC	1.5nF,10%,50V,Y5P,5x4,5,TP	
C274	59.1	266.3	2401-000486	C-AL	10uF,20%,50V,GP,6.3x7mm,2.5mm	
C401	147.4	199	2401-000025	C-AL	100uF,20%,16V,GP,8x11.5mm,3.5m	
C402	184.7	237	2401-000027	C-AL	4.7uF,20%,50V,GP,5x11mm,5mm,TP	
C403	172	236.2	2301-000174	(T)100V153J	CAP-MYLAR,153J,2A,5P	
C404	172	230.5	2301-000011	(T)100V102J	CAP-MYLAR,102J,2A,5P	
C405	183.3	222.7	2202-000561	C-CERAMIC,MLC-RADIAL	680pF,5%,50V,NPO,5.1x3.2,5.1,T	
C406	196.3	232	2401-000053	(T)25V10M	CAP-AL.ELEC,106M,1E	
C407	169.3	213.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C408	176.8	213.3	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C409	160.8	229	2303-000009	(T)100V332J	CAP-PPF,332J,2A,7.5P	
C410	175.9	241	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C411	155.4	191.3	2201-000376	C-CERAMIC,DISC	220pF,5%,50V,SL,4x4,5,TP	
C412	190.2	203.6	2301-000018	(T)100V473J	CAP-MYLAR,473J,2A,5P	
C413	187.7	207.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C414	195.2	203.6	2201-000019	CAP-CERAMIC,103Z,2H,DISC	10NF,500V,80-20%,Y5V,RADIAL	
C415	161.7	190.8	2301-000020	(T)100V273J	CAP-MYLAR,273J,2A,5P	
C416	154.3	149.6	2401-001422	C-AL	470uF,20%,35V,WT,13x25mm,5mm,T	
C417	148.7	175.8	2301-000184	C-FILM,PEF	1nF,10%,100V,5.3x10mm,5mm,TP	
C418	198.5	143.2	2403-000187	CAP-TANTAL,336K,1D	(T)33UF,20V,10%,DIP-RADIAL,5MM	
C420	203.6	152.9	2403-000187	CAP-TANTAL,336K,1D	(T)33UF,20V,10%,DIP-RADIAL,5MM	
C422	209	149	2201-000443	C-CERAMIC,DISC	3.3nF,10%,50V,Y5P,8.0X4.0,5,TP	
C423	226.8	147.2	2303-001022	C-FILM,PPF	2nF,5%,2.5KV,23x12x19mm,7.5mm	⚠
C424	224.5	157.3	2301-001169	C-FILM,PPF	1.8nF,5%,2.5KV,TP,22.5x20x12.5	⚠
C426	180.3	249.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C427	185.5	244.7	2305-000231	C-FILM,MPEF	1uF,10%,63V,7.5x15.5mm,5mm,TP	
C428	208.1	167.3	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C429	208.1	180.7	2301-000012	C-FILM,PEF	220pF,10%,1kV,10%,Y5P	17”
C430	230.5	257	2306-000125	C-FILM,MPPF	120nF,5%,250V,19x16x7.5mm,7.5mm	19”
			2306-000131	C-FILM,MPPF	150nF,5%,250V,19x15x7mm,7.5mm	17”
C431	230.5	266	2306-000125	C-FILM,MPPF	120nF,5%,250V,19x16x7.5mm,7.5mm	19”

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
			2306-000131	C-FILM,MPPF	150nF,5%,250V,19x15x7mm,7.5mm	17”
C433	239.3	275.7	2306-000234	C-FILM,MPPF	560nF,5%,250V,26.5x15mm,22.5mm	
C434	240	285.2	2306-000147	C-FILM,MPPF	1uF,5%,250V,26.5x19mm,22.5mm,B	
C435	230.5	295.5	2306-000119	C-FILM,MPPF	100nF,5%,250V,19x14.5x6.5mm,7.5mm	19”
			2306-000131	C-FILM,MPPF	150nF,5%,250V,19x15x7mm,7.5mm	17”
C437	230.5	304.5	2306-001011	C-FILM,MPPF	56nF,5%,250V,19x7.5x14.5,7.5mm	
C438	184.7	262.2	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C439	194	273.5	2401-001016	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	
C440	193	219.5	2201-000012	C-CERAMIC,DISC	220pF,10%,1KV,Y5P,6.3x5,5,TP	
C441	238	313.4	2306-000006	C-FILM,MPPF	330nF,5%,250V,20x18.5x10.5mm	
C442	199.8	290.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C445	155.3	226	2301-000257	C-AL	47uF,20%,35V,GP,8x11.5mm,5mm,T	
C502	114.8	43.2	2202-000517	CAP-CERAMIC,471J,2A	470PF,100V,5%,NPO,RE-RADIAL,DIP	
C503	138	49.1	2305-000359	C-FILM,MPEF	33nF,10%,100V,14.5x8.5mm,5mm,T	
C504	187.3	51.7	2301-001161	C-FILM,PPF	500pF,5%,1.6KV,TP,23x13.5x7.5	⚠
C505	164.1	61.1	2401-000925	(T)22UF,250V,20%,R-RADIAL	CAP-AL.ELEC,226M.2E,10X20	
C506	141.5	90.1	2306-000121	C-FILM,MPPF	100nF,5%,400V,21.5x13mm,7.5mm	
C507	178.1	31.6	2301-000019	C-FILM,PEF	47nF,10%,100V,8.9x5.1x13.5mm,5	
C508	212.8	38	2301-000174	(T)100V153J	CAP-MYLAR,153J,2A,5P	
C509	199.4	36.7	2401-000010	C-AL	220uF,20%,16V,GP,6.3x11mm,2.5m	
C510	239.8	29.1	2401-001166	C-AL	33uF,20%,16V,GP,5x11mm,5mm,TP	
C511	198.1	25.8	2201-000163	C-CERAMIC,DISC	10nF,+80-20%,50V,Y5V,6.5x5mm,2	
C512	232.4	42.3	2301-000010	C-FILM,PEF	100nF,5%,100V,11.5x12.5mm,5mm	
C513	227.4	37.2	2202-000561	C-CERAMIC,MLC-RADIAL	680pF,5%,50V,NPO,5.1x3.2,5.1,T	
C514	232.4	29	2401-000031	C-AL	47uF,20%,16V,GP,6.3x11mm,5mm,T	
C515	204.3	25.8	2201-000163	C-CERAMIC,DISC	10nF,+80-20%,50V,Y5V,6.5x5mm,2	
C516	220.4	61.9	2401-001576	C-AL	47uF,20%,50V,GP,8x11.5mm,5mm,T	
C517	227.8	128	2401-000031	C-AL	47uF,20%,16V,GP,6.3x11mm,5mm,T	
C518	145.5	117.2	2305-000009	C-FILM,MPEF	100nF,5%,250V,13x11x6.5,7.5mm	
C519	172	132.5	2301-000010	C-FILM,PEF	100nF,5%,100V,11.5x12.5mm,5mm	⚠
C520	139.8	135.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	⚠
C521	227.8	60.1	2305-000138	C-FILM,MPEF	100nF,10%,63V,7.5x12.5mm,5mm,T	
C522	227.9	67.7	2401-001016	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	⚠
C523	140.6	185.5	2401-000053	(T)25V10M	CAP-AL.ELEC,106M,1E	
C524	144.6	31	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C525	228.3	134.5	2305-000138	C-FILM,MPEF	100nF,10%,63V,7.5x12.5mm,5mm,T	
C526	191	31.5	2301-000018	(T)100V473J	CAP-MYLAR,473J,2A,5P	
C551	126.9	133.4	2401-000043	C-AL	1uF,20%,160V,GP,6.3x11mm,5mm,T	
C552	108.1	105.6	2305-000004	C-FILM,MPEF	220nF,10%,100V,12.7x16,5mm,TP	
C553	132.2	82.4	2201-000285	C-CERAMIC,DISC	1nF,10%,1KV,Y5P,8.0X4.0,5,TP	
C555	172.9	31.6	2301-000014	C-FILM,PEF	6.8nF,5%,100V,5.8x12.5mm,5mm,T	
C601	45.8	59	2501-000203	CAP-MPAPER,474K,250VAC	470NF,250VAC,10%,X2,RE-RAD,25.4	⚠
C602	53.6	43.3	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C603	53.5	58.1	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C604	95.8	44.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C605	23.3	124.6	2201-000522	C-CERAMIC,DISC	4.7nF,+80-20%,50V,Y5V,4x3,5,TP	
C607	32.6	85.9	2401-001137	CAP-AL.ELEC,337M,2G,30X40	(B)330UF,400V,20%,R-RADIAL	⚠

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C608	20.6	92.2	2201-000019	CAP-CERAMIC,103Z,2H,DISC	10NF,500V,80-20%,Y5V,RADIAL	⚠
C609	31.3	106	2201-000012	C-CERAMIC,DISC	220pF,10%,1KV,Y5P,6.3x5,5,TP	⚠
C610	35.4	190.9	2301-000011	(T)100V102J	CAP-MYLAR,102J,2A,5P	
C611	13	161.6	2401-003222	C-FILM,PEF	2.2nF,5%,100V,10.5x12.5x6.5,5m	
C613	49.4	103.4	2401-000374	C-AL	100uF,20%,63V,WT,10x12.5mm,5mm	⚠
C614	63.1	117.3	2401-000040	C-AL	47uF,20%,250V,WT,16x25mm,7.5mm	
C615	41.2	185.8	2201-000023	C-CERAMIC,DISC	2.2nF,20%,125V,Y5U,11x7,5,TP	⚠
C651	91.3	203.8	2401-001173	C-AL	33uF,20%,250V,GP,12.5x20mm,5mm	⚠
C652	72.5	191.2	2401-003003	ALCAPACITOR	68uF,20%,100V,GP,10x16mm,5mm,T	
C654	97.8	117	2401-000374	C-AL	100uF,20%,63V,WT,10x12.5mm,5mm	
C655	63.5	214.7	2301-000022	C-FILM,PEF	100nF,10%,200V,11.0X14.0X7.0,7	
C657	88.2	218.9	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C658	114.3	153	2401-000164	C-AL	1000uF,20%,25V,WT,12.5x20mm,5m	
C659	99.6	186.4	2401-001173	C-AL	33uF,20%,250V,GP,12.5x20mm,5mm	⚠
C660	113.3	166.8	2401-000142	C-AL	1000uF,20%,16V,WT,10x20mm,5mm	
C661	98.7	172	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C662	114.1	193.2	2401-000024	C-AL	1000uF,20%,25V,GP,13x25mm,5mm	
C663	7.4	212.3	2401-000597	C-AL	1uF,20%,50V,GP,4x7mm,1.5mm,TP	
C664	20.2	212.8	2401-000310	(T)25V100M	CAP-AL.ELEC,107M,1E	
C665	12.7	217	2201-000443	C-CERAMIC,DISC	3.3nF,10%,50V,Y5P,8.0X4.0,5,TP	
C666	21.9	222	2301-000174	(T)100V153J	CAP-MYLAR,153J,2A,5P	
C667	99.5	131.9	2401-003224	C-AL	470uF,20%,16V,WT,TP,8X11.5,5mm	
C668	114.9	225	2401-000310	(T)25V100M	CAP-AL.ELEC,107M,1E	⚠
C669	120.4	236.4	2401-000039	(T)1000UF,16V,20%,R-RAD	CAP-AL.ELEC,108M.1C,10x16	
C670	13.7	255.2	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C671	7.3	260.2	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C672	34.5	234.4	2201-000016	C-CERAMIC,DISC	2.2nF,10%,500V,Y5P,8x4,5,TP	
C673	61.2	224	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C674	35.4	214.6	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
C675	43	220.4	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C680	60.7	191.4	2401-000029	C-AL	10uF,20%,100V,GP,8x11.5mm,5mm	
CF201	62.7	327.4	BH39-40363W	CBF-HARNESS	15P,350MM,BLK/WHT/RED/GRN,UL10	
CF202	62.7	327.4	BH39-40363X	CBF-HARNESS	14P,350MM,BLK/WHT/RED/GRN,UL10	
CN201	74.2	273.4	3711-003849	CONNECTOR-HEADER	BOX,7P,1R,2mm,STRAIGHT,SN	
CN202	133.2	222.9	3711-003241	CONNECTOR-HEADER	BOX,14P,1R,2.5mm,STRAIGHT,SN	
CN203	34.4	318.9	3711-003851	CONNECTOR-HEADER	BOX,10P,1R,2mm,STRAIGHT,SN	
CN204	171.9	266.2	3711-003850	CONNECTOR-HEADER	BOX,8P,1R,2mm,STRAIGHT,SN	
CN402	210.1	187.4	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN403	218.1	187.4	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN404	226.1	187.4	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN405	138.5	159.8	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN406	158.5	159.8	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN407	138.5	170	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN408	158.5	170	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN411	200.1	187.4	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN412	224.3	206.6	3711-000217	STRAIGHT,1WALL	CON-WALLHEADER,3P,3.96	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
CN501	240.1	44.1	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN601	80.9	38.7	3711-000217	STRAIGHT,1WALL	CON-WALLHEADER,3P,3.96	
CN602	65.4	44.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN603	65.4	35.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN604	80	91.7	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN605	80	111.7	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN607	35.5	186.1	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN608	15.5	186	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN609	14.5	130.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN610	14.5	150.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
D1	14.5	150.5	0402-000017	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D202	142.5	246.2	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D251	142	242.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D252	139.5	243.8	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D401	164	213.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D402	174.3	205.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D403	150	189	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D404	142.5	222.7	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D405	147.5	204.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D406	190.2	207.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D407	161.5	175	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D408	139.5	153.5	0402-000274	DIODE-REC,UF4004,DO-41	400V,1A,1V,1A,50NS,0.5A	
D410	211.6	138	0402-000126	DIODE-RECTIFIER	1N4001GP,50V,1A,DO-41	
D411	228.4	231.4	0402-000272	DIODE-REC,UF4001,DO-41	50V,1A,1V,1A,50NS,0.5A	
D412	240.4	197.3	0402-000445	DIODE-REC,MUR10150E	TO-220,ST02169-205-180	⚠
D413	218.4	252.8	0402-000007	DIODE-RECTIFIER	1N4937GP,600V,1A,DO-41	
D414	229.3	236.1	0402-000007	DIODE-RECTIFIER	1N4937GP,600V,1A,DO-41	
D415	192.6	215.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D416	189.1	236.8	0402-000274	DIODE-REC,UF4004,DO-41	400V,1A,1V,1A,50NS,0.5A	
D417	208	142.5	0402-000126	DIODE-RECTIFIER	1N4001GP,50V,1A,DO-41	
D418	223.8	142.5	0402-000126	DIODE-RECTIFIER	1N4001GP,50V,1A,DO-41	
D419	201	167.5	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	19”
D501	177.8	39.4	0402-000208	DIODE-REC	EK-04,40V,1.5A,DO-41	
D502	152.4	62.5	0404-000001	DIODE-SCHOTTKY	FMP-G2FS,1500V,5A,50UA,TO-220,ST	⚠
D503	147.9	46	0402-000274	DIODE-REC,UF4004,DO-41	400V,1A,1V,1A,50NS,0.5A	
D504	152	26	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D505	210	43.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D506	182.3	24	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D507	224	38	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D508	147.5	101.1	0402-000017	DIODE-RECTIFIER	RGP02-12,1200V,0.5A,DO-204AL	
D509	204.3	66	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	⚠
D510	150.5	137	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	⚠
D511	136.2	100	0402-000017	DIODE-RECTIFIER	RGP02-12,1200V,0.5A,DO-204AL	
D515			0402-000274	DIODE-RECTIFIER	UF4004,1A,DO-41	
D551	116.1	124.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D552	129	123.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D553	129.1	104.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
D559			0402-000274	DIODE-RECTIFIER	UF4004,1A,DO-41	
D601	53.7	69.9	0402-000549	DIODE-BRIDGE	RBV606,600V,6A,BK	19" ⚠
			0402-000104	DIODE-BRIDGE	D3SBA60,600V,4A	17" ⚠
D603	100	27.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D605	23.1	186.9	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D606	31.1	191.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D608	35.9	102.3	0402-000252	DIODE-RECTIFIER	RGP02-16E,1.6KV,0.5A,DO-41	⚠
D610	24.4	168.7	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	
D611	13.4	172.2	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	
D612	53.2	127.6	0402-000274	400V,1A,1V,1A,50NS,0.5A	DIODE-REC,UF4004,DO-41	⚠
D615	67.9	87.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D616	48	125.8	0402-000250	DIODE-RECTIFIER	RG4C,1000V,1A	
D651	89	175.7	0402-000250	DIODE-RECTIFIER	RG4C,1000V,1A	⚠
D653	59.9	181.7	0402-000454	DIODE-RECTIFIER	RG10V1,400V,1.2A,DO-201	⚠
D654	16	219	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D655	87.8	139	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D656	92.4	148	0402-000274	400V,1A,1V,1A,50NS,0.5A	DIODE-REC,UF4004,DO-41	
D657	87.8	148	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D658	104.5	229.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	⚠
D659	87.8	157	0402-000249	DIODE-RECTIFIER	RG4,400V,1.5A	
D660	107.8	166	0402-000454	DIODE-RECTIFIER	RG10V1,400V,1.2A,DO-201	
D661	90.1	258	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	⚠
D662	59	210.2	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D663	55	179.5	0402-000012	DIODE-RECTIFIER	UF4007,1KV,1A,DO-41	
F651	94.2	133.5	3601-001092	FUSE-FERRULE	125V,2.5A,SLOW-BLOW,EPOXY,7.1x	⚠
F652	84.7	191.8	3601-001092	FUSE-FERRULE	125V,2.5A,SLOW-BLOW,EPOXY,7.1x	⚠
F653	97.8	152.5	3601-001092	FUSE-FERRULE	125V,2.5A,SLOW-BLOW,EPOXY,7.1x	⚠
F655	107.9	171.4	3601-001092	FUSE-FERRULE	125V,2.5A,SLOW-BLOW,EPOXY,7.1x	⚠
FG601	8	45	3601-000455	FUSE-FERRULE	250V,4A,TIME-LAG,GLASS,5.2x20m	⚠
FH601	8	70	3602-000001	800GF,400-800GF	FUSE-CLIP,5.2X20,30MOHM	
HS401	206.7	202.6	BH62-30024B	HEAT/SINK-IC	SPC-1,T1,SNCOATING	
HS402	197.3	253.4	BH62-30419A	HEAT/SINK-IC	A6063S,T1.0,S-PRO	
HS405	237.2	45	BH62-30400A	HEAT/SINK-FBT	A1050,T2,G17E/B/P	
HS409	210.4	278	BH62-30024A	HEAT/SINK-TR	SPC,T1,SN,CFX1577L	
HS410	210.4	293.7	BH62-30024A	HEAT/SINK-TR	SPC,T1,SN,CFX1577L	
HS501	145.4	38.8	BH62-30312A	HEAT/SINK-TR	A1050A,T3,DEGRE,311140	
HS502	149.8	59.9	BH62-30024B	HEAT/SINK-IC	SPC-1,T1,SNCOATING	
HS551	113.5	120.1	BH62-30024A	HEAT/SINK-TR	SPC,T1,SN,CFX1577L	
HS552	132.5	112.7	BH62-30024A	HEAT/SINK-TR	SPC,T1,SN,CFX1577L	
HS601	28.9	142.9	BH62-30412D	HEAT/SINK	A6063S,T1.8,CSH780B	
HS602	73.5	82	BH62-30312A	HEAT/SINK-TR	A1050A,T3,DEGRE,311140	
HS605	106.8	235.2	BH62-30312A	HEAT/SINK-TR	A1050A,T3,DEGRE,311140	
HS606	19.9	250.2	BH62-30015A	HEAT/SINK-TR	SCP-1,T1,SN,CVM4967,3111	⚠ ⚠
IC201	114.6	302.7	0903-001063	IC-MICROCONTROLLER	72E75,8BIT,DIP,42P,600MIL,24MH	
IC202	135.4	303.6	1203-001274	IC-VOL.DETECTOR	7545,TO-92,3P,PLASTIC,4.35/4	
IC203	149.5	305.9	1103-001086	IC-EEPROM	24LC08B,256x8BIT,DIP,8P,300MIL	
IC204	94.2	279.7	2011-000161	R-NETWORK	10Kohm,10%,1/8W,A,SIP,10P,TP	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
IC205	165.2	261.6	2011-000161	R-NETWORK	10Kohm,10%,1/8W,A,SIP,10P,TP	
IC251	41.8	281.6	1204-001323	IC-DEF.PROCESSOR	TDA9110,DIP,32P,300MIL,PLASTIC	
IC401	169	225	1203-001099	IC-PWMCONTROLLER	3843,DIP,8P,250MIL,PLASTIC,30V	⚠ ⚡
IC402	188.8	257	1201-000109	IC-AUDIOAMP	2006,HENTWAT,5P,SINGLE,PLA	⚡
IC501	225.3	33	1203-000182	IC-POSI.ADJUSTREG.	494,DIP,16P,300MIL,PLASTIC	
IC502	167.2	130.5	1203-000002	TO-92,3,36V(T)-SIMPLE	IC-LIN,431,REGULATOR	⚠
IC601	20.8	153.1	BH13-10335N	IC-HYBRID	CSH780B,STR-S6719A,ZIP,9P,S/W	⚠ ⚡
IC602	12.2	202.5	0604-001018	PHOTO-COUPLER	DAR-TR,63-125%,200mW,DIP-4,ST	⚠
IC604	6.3	221.6	1203-000002	TO-92,3,36V(T)-SIMPLE	IC-LIN,431,REGULATOR	⚠ ⚡
IC605	110.1	231.6	1203-000165	TO-220,4,5V	IC-LIN,KA78R12,REGULATOR	⚠ ⚡
IC606	23.6	247.7	1203-000001	TO-220,3,5V	IC-LIN,7805,REGULATOR	
IC607	49	240.8	0801-000699	IC-CMOSLOGIC	74HC125,BUFFER,DIP,14P,300MIL	
IC608	68.8	246.3	0801-000913	IC-CMOSLOGIC	74HC74,DFLIP-FLOP,DIP,14P,300	
ICS203	68.8	246.3	3704-000447	SOCKET-IC	74HC74,DFLIP-FLOP,DIP,14P,300	
JW201	130.3	263.6	BH39-40306D	CBF-HARNESS	80MM,BLK,1015,AWG22	
JW251	61.7	284.1	BH39-40306C	CBF-HARNESS	60MM,BLK,1015,AWG22	
JW252	19.5	312.2	BH39-40306C	CBF-HARNESS	60MM,BLK,1015,AWG22	
L401	222.1	224.1	BH27-20344M	COIL-CHOKE	3.5MH,10%,DR14*20,BULK	
L402	224.5	169.9	BH26-30338B	TRANS-H.LINEARITY	34.0MH/3.70UH,6P,SDR8.06*19.05	19" ⚠
			BH26-30338C	TRANS-H.LINEARITY	34.0MH/3.70UH,6P,SDR8.06*19.05	17" ⚠
L403	231.8	243.8	2701-000128	INDUCTOR-AXIAL	15uH,10%,4.2x9.8mm	
L501	199.5	60.9	2701-000154	FIX,220UH,10%,4X10.5MM	INDUCTOR-AXIAL,220UH	
L502	199.5	66	2701-000154	FIX,220UH,10%,4X10.5MM	INDUCTOR-AXIAL,220UH	⚠
L503	223.3	129.8	2701-000154	FIX,220UH,10%,4X10.5MM	INDUCTOR-AXIAL,220UH	
L504	135	70.1	BH27-20344M	COIL-CHOKE	3.5MH,10%,DR14*20,BULK	
L601	18.4	62	BH27-20344L	COIL-LINEFILTER	40MH,MIN,SQE-3535,BULK	⚠
L604	110.4	211.3	2701-000179	FILTER-EMIACLINE	250V,3A	
POS601	78.9	63.3	1404-000135	THERMISTOR-PTC	10ohm,20%,-,290V,30A	⚠
Q201	83	288	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q202	88	281.7	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q204	8	308.5	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q251	126.4	246	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q252	65.5	285.3	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q253	9.3	267.3	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q254	9.3	274	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q401	179.3	234	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q402	152.5	217	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q403	155.2	182	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q404	167	241.9	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q405	209.4	205.4	0505-001130	FET-SILICON	IRF740A,N,400V,10uA,550mohm,13	
Q406	144.3	147.4	0505-001136	FET-SILICON	IRF610A,N,200V,3.3A,1.5ohm,38W	
Q407	240.6	143.2	0502-000364	TR-POWER	MJL16218,NPN,170W,TO-3P,BK,3-1	⚠
Q409	213.2	275.5	0505-001135	FET-SILICON	IRF640A,N,200V,18A,0.18ohm,139	
Q410	213.2	291.2	0505-001135	FET-SILICON	IRF640A,N,200V,18A,0.18ohm,139	
Q411	204.8	305	0505-001129	FET-SILICON	IRF630A,N,200V,10uA,400mohm,72	
Q412	214	313.5	0505-001129	FET-SILICON	IRF630A,N,200V,10uA,400mohm,72	
Q413	207.5	319.8	0505-001135	FET-SILICON	IRF640A,N,200V,18A,0.18ohm,139	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
Q414	185.5	312.5	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q501	119.3	50.2	0505-001136	FET-SILICON	IRF610A,N,200V,3.3A,1.5ohm,38W	
Q502	183	41.5	0502-001001	TR-POWER	KSC5088,NPN,1500V,1500V,8A,50W	⚠
Q503	147.9	42.7	0505-001130	FET-SILICON	IRF740A,N,400V,10uA,550mohm,13	
Q504	161.9	30.9	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q505	185.2	26.1	0501-000483	TR-SMALLSIGNAL	KSP2222A,NPN,625mW,TO-92,TP,10	
Q506	143.7	138.6	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	⚠
Q507	167	30.9	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q551	111	122.7	0502-000348	TR-POWER	NPN,2W,TO-220,15-75	
Q552	130	109.9	0502-000351	TR-POWER	PNP,2W,TO-220AB,15-75	
Q553	127.6	125.8	0501-000140	TR-SMALLSIGNAL	2N5551,NPN,625mW,TO-92,80-25	
Q554	132.7	92.5	0502-001060	TR-POWER	KSC5042M,NPN,4W,TO-126,ST,30-	
Q601	103	31.1	0501-000010	0.8W,80V,60V,8V,0.7A	TR-NPN,KSC1008,TO-92,ECB	
Q602	76	85.9	0502-000291	TR-POWER	KSD401,NPN,25W,TO-220,120-24	
Q651	76	218.9	0502-001011	TR-POWER	2SA1667,PNP,25W,TO-220F,ST,60-	
Q652	70.8	207.1	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
Q653	93.5	236.4	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q654	93.5	242	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q655	101.1	234.5	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	⚠
Q658	64.9	228.7	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q659	51	210.3	0505-000016	FET-SILICON	ZVN3310A,N,100V,200mA,10ohm,62	
Q660	61.3	202.3	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
R201	82.2	285	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R202	85.3	275	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R203	79.9	292.4	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R204	87.6	294.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R205	110.9	297.9	2001-000054	REF-CF,3.9K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R206	97.9	293.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R207	99	283.6	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R208	100	281.2	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R209	100	278.8	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R210	100	276.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R211	100	274	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R212	118.4	246.4	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R213	101	269.2	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R214	100.8	265.2	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R215	168.1	297.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R216	162.6	297.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R217	132.7	297.6	2001-000035	REF-CF,220,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R218	159.4	281.1	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R219	159.4	278.6	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R220	97.9	290.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R222	146.4	269.2	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R223	146.4	266.7	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R224	159.4	264.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R225	160.4	259.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R226	133.6	283	2001-000738	R-CARBON	4.7Mohm,5%,1/6W,AA,TP,1.8x3.2m	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R227	116	264.4	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R228	96.9	302.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R229	13.7	302.5	2001-001178	REF-CF,680,5%,1/2W(S)	300V,-200TO+200PPM/C,R-AXIAL	
R230	11	302.5	2001-001192	REF-CF,820,5%,1/2W(S)	300V,-350TO+350PPM/C,R-AXIAL	
R231	43	324	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R233	82.9	275	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	19”
			2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	17”
R234	97.9	300.3	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R235	97.9	295.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R236	167.5	302.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R237	167.5	312.1	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R238	175.4	279.5	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R239	102.8	262.8	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R251	33.5	263.8	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R252	35.9	263.8	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R253	29	284	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R254	55.5	287.5	2001-000457	R-CARBON	2.2ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R255	60.5	298.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R256	67	303.9	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R257	56	296.1	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R258	57	293.4	2004-004090	R-METAL	6.49Kohm,1%,1/4W,AA,TP,2.5x6.5	
R259	56	274.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R260	61	269.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R261	8.5	279.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R262	11.5	296.8	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R263	46.3	280	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R264	180.2	279.5	2001-000963	R-CARBON	75Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R265	177.8	292.5	2001-000765	R-CARBON	43Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R266	70.9	266.8	2001-000538	R-CARBON	24Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R267	182.6	279.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R268	43	272.3	2001-000561	REF-CF,27K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R269	48.5	298.7	2001-000243	R-CARBON	1.5Mohm,5%,1/6W,AA,TP,1.8x3.2m	
R270	120.9	243.7	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R271	20.5	278	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R275	9.5	270.7	2001-000088	R-CARBON	120Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R401	166.5	213.3	2001-000110	R-CARBON	10ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R402	171.8	205.3	2001-000644	REF-CF,330K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R403	174.5	224.3	2001-000678	REF-CF,36K,5%,1/6W	150V,-1300TO+350PPM/C,1.9X3.2	
R404	173	233.3	2001-000538	R-CARBON	24Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R405	152.8	242	2001-000074	REF-CF,33K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R406	144.7	237.5	2001-001178	REF-CF,680,5%,1/2W(S)	300V,-200TO+200PPM/C,R-AXIAL	
R407	150	204.5	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R408	158.3	191.3	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R409	152.5	194.5	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R410	152.3	187	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R411	159	175	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R412	211.8	235.5	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R414	231.9	138.8	2003-000659	R-METALOXIDE(S)	33ohm,5%,1W,AA,TP,3.3x9mm	
R416	158.8	219.3	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R417	161.3	212.5	2001-000494	R-CARBON	20Kohm,2%,1/6W,AA,TP,1.8x3.2mm	
R418	156.4	212.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R419	209.4	215.5	2001-001187	REF-CF,75,5%,1/2W(S)	300V,-200TO+200PPM/C,R-AXIAL	
R420	185.2	207.5	2001-000059	REF-CF,5.6K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R421	195	207.5	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R422	198.4	208.9	2008-000147	REF-FUSIBLE,22,5%,1/4W	-350TO+350PPM/C,R-AXIAL	⚠
R423	213.4	212.2	2008-000140	REF-FUSIBLE,2.2,5%,1/2W	-350TO+350PPM/C,R-AXIAL	⚠
R424	138.5	170	2003-000780	R-METALOXIDE(S)	68ohm,5%,3W,AA,TP,6x16mm	
R425	138.5	159.8	2003-000780	R-METALOXIDE(S)	68ohm,5%,3W,AA,TP,6x16mm	
R426	126.5	149.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R427	147.5	156.9	2001-000036	R-CARBON	330ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R428	185.5	187	2001-000625	REF-CF,330,5%,1/2W	350V,-350TO+350PPM/C,R-AXIAL	
R429	212.8	231.4	2003-000423	REF-MO,1.2,5%,3W(T)	-359TO+350PPM/C,R-AXIAL	
R430	198.2	180.7	2003-000650	REF-MO,330,5%,2W(S)	500V,-200TO+200PPM/C,R-AXIAL	
R431	188.5	279.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R432	201.4	256.6	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R433	181.9	265.8	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R434	194.9	261.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R435	176.3	244.7	2001-000226	R-CARBON	1.2ohm,5%,1/2W,AA,TP,3.3x9mm	
R436	115.9	177	2003-000004	R-METALOXIDE(S)	7.5ohm,5%,3W,AA,TP,6x16mm	
R438	217.3	271.7	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R439	217.5	290.5	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R440	211	311	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R442	199.8	287.8	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R443	199.8	302.8	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R444	199.8	297.8	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R445	199.8	295.3	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R447	199.8	285.3	2001-000644	REF-CF,330K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R448	199.8	305.3	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R449	199.8	300.3	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R450	199.8	292.8	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R452	184.6	251.5	2003-000370	R-METALOXIDE	75ohm,5%,2W,AA,TP,6x16mm	
R453	232.8	319.5	2003-000448	R-METALOXIDE(S)	100Kohm,5%,2W,AA,TP,4x12mm	
R454	199.8	308.8	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R455	199.8	311.3	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R456	210	322.9	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R457	182.5	307.8	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R458	231.8	239.6	2001-000705	R-CARBON	39ohm,5%,1/2W,AA,TP,3.3x9mm	
R460	203.9	160.7	2003-000580	R-METALOXIDE(S)	220ohm,5%,3W,AA,TP,6x16mm	19”
R480	136.5	185.4	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R501	112.1	53.6	2001-000029	REF-CF,100,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R502	110.6	33.4	2001-001107	R-CARBON(S)	220ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R503	106.4	53.4	2003-000505	R-METALOXIDE(S)	150ohm,5%,3W,AA,TP,6x16mm	⚠
R504	162.8	36	2003-000376	R-METALOXIDE	8.2ohm,5%,1W,AA,TP,4.3x12mm	
R505	177.8	49.8	2003-000760	R-METALOXIDE(S)	6.8ohm,5%,2W,AA,TP,4x12mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R506	151.5	112.1	2008-000150	REF-FUSIBLE,3.3,5%,1/2W	-350TO+350PPM/C,R-AXIAL	⚠
R507	148.4	26	2001-001096	REF-CF,2.2,5%,1/2W(S)	300V,-200TO+200PPM/C,R-AXIAL	
R508	169.9	30	2001-000104	REF-CF,1.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R509	112.1	56	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R510	215.9	40.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R511	203.5	41	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R512	236	43.9	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R513	228	33.5	2001-000057	R-CARBON	5.1Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R514	236.5	30	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R515	224.6	48.5	2001-000057	R-CARBON	5.1Kohm,5%,1/6W,AA,TP,1.8x3.2m	⚠
R516	230.5	123.1	2004-001298	R-METAL	82Kohm,2%,1/4W,AA,TP,2.4x6.4mm	⚠
R517	233.2	123.1	2004-000001	R-METAL	6.2Kohm,1%,1/4W,AA,TP,2.4x6.4m	⚠
R518	150.5	134.5	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	⚠
R519	137.1	136	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	⚠
R520	161.5	129.9	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	⚠
R521	227.5	56.5	2004-001349	REF-MF,91K,1%,1/4W	250V,-100TO+100PPM/C,R-AXIAL	⚠
R522	223.3	133.3	2003-000683	R-METALOXIDE(S)	4.7Kohm,5%,1W,AA,TP,3.3x9mm	
R523	194.9	25	2001-000923	R-CARBON	680ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R551	128.2	158	2003-000006	R-METALOXIDE	47ohm,5%,1W,AA,TP,4.3x12mm	
R552	107.8	109.7	2001-000065	R-CARBON	10Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R553	126.1	106.7	2001-001153	R-CARBON(S)	47ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R554	131.7	129	2001-000054	REF-CF,3.9K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R555	133	115.2	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R556	135.7	115.2	2001-001138	R-CARBON(S)	390ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R557	107.8	97.1	2001-001195	R-CARBON(S)	330Kohm,5%,1/2W,AA,TP,2.4x6.4m	
R559	143.6	112.1	2001-000847	R-CARBON	560Kohm,5%,1/2W,AA,TP,3.3x9mm	
R560	109.8	80.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R561	120.7	107.8	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R562	109.8	83	2001-000877	R-CARBON	6.2Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R601	39.3	38	2001-001129	R-CARBON(S)	330Kohm,5%,1/2W,AA,TP,2.4x6.4m	⚠
R602	106.8	39	2001-000023	R-CARBON	47ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R603	106.8	42	2001-001093	REF-CF,2.2K,5%,1/2W(S)	300V,-200TO+200PPM/C,R-AXIAL	
R604	32.6	121.4	2001-000652	R-CARBON	330ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R605	14.8	75.1	2003-000011	R-METALOXIDE(S)	68Kohm,5%,3W,AA,TP,6x16mm	⚠
R606	58.3	76.3	2003-000855	R-METALOXIDE(S)	56Kohm,5,3W,AA,TP,6x16mm	
R607	41.7	169.7	2001-000042	R-CARBON	1Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R608	15.5	186	2005-001013	R-WIREWOUND,NON	0.14ohm,1%,3W,AA,TP,5.5x15mm	
R609	14.5	130.5	2003-000797	R-METALOXIDE(S)	8.2ohm,5%,3W,AA,TP,6x16mm	
R610	39.8	145.2	2001-000070	R-CARBON	15Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R611	46.8	140.9	2004-000532	R-METAL	20Kohm,1%,1/4W,AA,TP,2.4x6.4mm	
R612	29	119.2	2004-000201	R-METAL	100ohm,1%,1/4W,AA,TP,2.4x6.4mm	
R613	31.1	184.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R614	23.1	189.3	2001-000001	R-CARBON	2Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R615	31.1	194.1	2001-000054	REF-CF,3.9K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R616	71	91.7	2003-000006	R-METALOXIDE	47ohm,5%,1W,AA,TP,4.3x12mm	
R617	80	91.7	2003-000512	R-METALOXIDE(S)	15Kohm,5%,3W,AA,TP,6x16mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R651	103.9	199.8	2003-000448	R-METALOXIDE(S)	100Kohm,5%,2W,AA,TP,4x12mm	⚠
R652	74.9	178.2	2001-001131	R-CARBON(S)	33KOHM,5%,1/2W,AA,TP,2.4X6.4mm	⚠
R654	80.5	191.8	2003-000516	REF-MO,15,5%,3W(S)	350V,-350TO+350PPM/C,R-AXIAL	
R655	76.8	193.8	2001-001108	R-CARBON(S)	22Kohm,5%,1/2W,AA,TP,2.4x6.4mm	
R656	72.7	219.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R657	73.7	212.6	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R658	84.8	252.7	2001-000074	REF-CF,33K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R659	90.1	262	2001-000001	R-CARBON	2Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R660	28.6	226.4	2004-001136	R-METAL	6.8Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R662	102.6	157	2008-000102	REF-FUSIBLE,0.22,5%,1W	-350TO+350PPM/C,R-AXIAL	⚠
R663	97.1	241.4	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	⚠
R664	15.5	213.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R665	13	205.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R666	16.1	216.5	2001-000484	R-CARBON	200Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R667	19.1	229.6	2003-000521	R-METALOXIDE(S)	180Kohm,5%,1W,AA,TP,3.3x9mm	⚠
R668	6.2	246.5	2004-004158	R-METAL	250ohm,1%,1/4W,AA,TP,6.5x2.3mm	⚠
R669	14.5	225.7	2004-000176	R-METAL	1.8Kohm,1%,1/4W,AA,TP,2.4x6.4m	⚠
R673	87.7	275	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	⚠
R674	113.6	230.8	2001-000988	REF-CF,820K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	⚠
R675	61.7	231.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R676	50.9	244.9	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R677	127.4	215.6	2001-000074	REF-CF,33K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	⚠
R678	207.8	303.5	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R679	87.5	245	2001-000001	R-CARBON	2Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R680	50.2	248.2	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R682	68.2	249.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
R683	59.4	242.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300TO+350PPM,R-AXIAL	
R684	51.5	222	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R685	41.5	251.5	2003-000541	R-METALOXIDE(S)	1Kohm,5%,3W,AA,TP,6x16mm	
R686	41.5	251.5	2001-001146	REF-CF,4.7K,5%,1/6W	150V,-1300TO+350PPM/C,R-AXIAL	
RL601	95.8	34.4	3501-000136	RELAY-MINIATURE	12V,360mW,5A,1FormA,10mS,10mS	⚠
SK501	215.3	56.5	4715-000001	SURGEABSORBER	1KV,+50-10%	
T401	189.7	152.8	BH26-30337R	TRANS-HOR.DRIVE	4.5mH,8P,EI2519,SB5S,4.5mH/154	⚠
T402	189.3	183.7	BH26-30337S	TRANS-HOR.PULSE	2mH,10P,EI3026,PL3,2mH/870nH	⚠
T403	206.3	227.5	BH26-30304F	CORE/BOBBIN;EI16,CSG9511	TRANS-H-SIZEDRIVE	⚠
T501	130.9	28.7	BH26-30337Q	TRANS-HOR.DRIVE	5.0mH,8P,EI1916,SB5S,5.0mH/277	⚠
T502	177.7	92	BH26-10335K	TRANS-FBT	670UH,15P,670UH,Y265383	⚠
T502(M)	177.7	92	BH26-10335H	TRANS-FBT	602uH,15P,FSY21A001	
T503	120.5	77	BH26-30304X	TRANS-H/VREG.CFA7679	EI28X20MM,CFA7679(PINTYPE)	⚠
T551	126.5	86.3	BH26-30337P	TRANS-FOCUS	2.8mH/2.75mH,8P,EI2519,SB5S,2.	⚠
T601	55.4	174.1	BH26-20335W	TRANS-POWER	190uH,18P,ER4445,PM2,6uH,160mO	⚠
T602	40.9	196.3	BH26-30302M	TRANS-SYNC.	3-1(1.9-2.8MH),5P,3-1(1.9-	⚠
TCO	185.8	195.1	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
TH601	65.4	35.5	1404-001021	THERMISTOR-NTC	8ohm,15%,3250K,27.2mW/C,TP	⚠
VR401	235.5	250.6	2103-001049	VR-SEMI	100ohm,30%,1/3W,SIDE	
VR501	237	53.5	2103-000454	VR-SEMI	50Kohm,25%,0.3W,SIDE	☢

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
X201	134.9	286.5	2801-003413	CRYSTAL-UNIT	24MHz,30ppm,28-ABQ,18pF,20ohm	
ZD201	55.7	319.9	0403-000007	DIODE-ZENER	UZ6.2BM,6.2V,6.0-6.4V,500mW,DO	
ZD202	58.7	317.5	0403-000007	DIODE-ZENER	UZ6.2BM,6.2V,6.0-6.4V,500mW,DO	
ZD203	38	324	0403-000007	DIODE-ZENER	UZ6.2BM,6.2V,6.0-6.4V,500mW,DO	
ZD204	54.7	322.3	0403-000007	DIODE-ZENER	UZ6.2BM,6.2V,6.0-6.4V,500mW,DO	
ZD401	161.9	239.4	0403-000342	DIODE-ZENER	UZ3.6BSA,3.6V,3.47-3.68V,500mW	
ZD601	67.2	101.4	0403-000366	DIODE-ZENER	UZ7.5BM,7.5V,7.2-7.7V,500mW,DO	
ZD602	72.3	215.9	0403-000372	DIODE-ZENER	UZ9.1BM,9.1V,8.5-9.6V,500mW,DO	

9-2 Video PCB Parts

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
B	311.3	41	3705-000103	CON-JACK BNC		
BD01	260.4	89	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD02	202.4	71.1	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD03	204	86.7	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD05	243	105.1	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD07	185.9	94.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
C103	246.4	106.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C104	247	111	2401-000025	C-AL	100uF,20%,16V,GP,8x11.5mm,3.5m	
C105	247.3	91.4	2201-000615	C-CERAMIC,DISC	56pF,5%,50V,SL,5.0x3.0,2.5mm,T	
C106	251.7	97.8	2301-000015	C-FILM,PEF	10nF,5%,100V,7x3.2x7mm,5mm,TP	
C107	261.5	95.9	2305-000138	C-FILM,PEF	3.3nF,5%,100V,5.8x12.5mm,5mm,T	
C108	262	92.3	2201-000378	C-CERAMIC,DISC	33pF,10%,50V,SL,4x3.5,5,TP	
C109	257	78.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C110	233.6	70.4	2401-000042	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C112	225.8	96.9	2201-000680	C-CERAMIC,DISC	82pF,5%,50V,NPO,8x3.5,5,TP	
C113	314.8	21.6	2401-002299	C-AL	4.7uF,20%,50V,GP,5x7,5,TP	
C114	323.3	89.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C115	317.6	73.6	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C116	314.5	80.7	2401-001509	(T)16V 47M	CAP-AL.ELEC,476M,1C,6.3X7MM	
C117	305.3	79.9	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C118	308.5	75.7	2401-001509	(T)16V 47M	CAP-AL.ELEC,476M,1C,6.3X7MM	
C119	295.9	79.8	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C120	298.4	75.7	2401-001509	(T)16V 47M	CAP-AL.ELEC,476M,1C,6.3X7MM	
C121	285.8	76.9	2401-000042	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C122	290.4	80.7	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C124	263.8	181.7	2401-000430	C-AL	10uF,20%,250V,GP,10x16mm,5mm,T	
C125	260.4	113.9	2401-000039	CAP-AL.ELEC,108M.1C,10x16	(T)1000UF,16V,20%,R-RADIAL	
C126	306	127.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C127	316.2	171.5	2401-003003	AL CAPACITOR	68uF,20%,100V,GP,10x16mm,5mm,T	
C128	250.8	120.8	2401-000430	C-AL	10uF,20%,250V,GP,10x16mm,5mm,T	
C129	274.7	130.7	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C130	269.8	130.5	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
C131	309.2	174.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C132	305.9	187.8	2202-000321	CAP-CERAMIC,104J,1H	100NF,50V,5%,X7R,RE-RADIAL,DIPP	
C133	312.9	180.2	2401-000613	C-AL	1uF,20%,50V,WT,5x11mm,5mm,TP	
C134	212.1	46.4	2201-000011	CAP-CERAMIC,470J,1H,NPO	47PF,50V,5%,NPOPPM,NPO,DISC-R	
C135	219.8	46.3	2201-000011	CAP-CERAMIC,470J,1H,NPO	47PF,50V,5%,NPOPPM,NPO,DISC-R	
C137	214.3	85.8	2401-000037	(T)470UF,16V,20%,R-RADIAL	CAP-AL.ELEC,477M,1C,8x11.5	
C138	219.4	91.2	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C139	258	168.8	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C140	220.6	111.3	2401-000039	(T)1000UF,16V,20%,R-RADI	CAP-AL.ELEC,108M.1C,10x16	
C141	303.1	20.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C142	216.4	101	2401-000039	(T)1000UF,16V,20%,R-RADI	CAP-AL.ELEC,108M.1C,10x16	
C143	287.6	119.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C144	208.4	96.1	2401-000029	C-AL	10uF,20%,100V,GP,8x11.5mm,5mm	
C145	236.2	37.3	2201-000146	CAP-CERAMIC,101J,1H,SL	100PF,50V,5%,P350TON1000PPM,SL	
C146	217.2	34	2401-000443	CAP-AL,ELEC,106M,1E,5X5	(T)10UF,25V,20%,R-RADIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C147	237.6	33.7	2401-000443	CAP-AL,ELEC,106M,1E,5X5	(T)10UF,25V,20%,R-RADIAL	
C148	294.3	70.2	2401-000597	C-AL	1uF,20%,50V,GP,4x7mm,1.5mm,TP	
C149	208.2	57.6	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C150	204.8	56.6	2201-000017	C-CERAMIC,DISC	1nF,10%,50V,Y5P,4x3.5,5,TP	
C153	223.7	82.4	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C154	99	73.5	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C155	200.2	24.7	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C156	187.9	30.2	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C157	187.8	34.3	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C158	187.8	40	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C159	317.4	68.9	2401-000443	CAP-AL,ELEC,106M,1E,5X5	(T)10UF,25V,20%,R-RADIAL	
C160	294.2	99.9	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C161	234	105.9	2202-000394	C-CERAMIC,MLC-RADIAL	1nF,5%,100V,NPO,5.1x3.2,5.1,TP	
C162	258.9	196.5	2201-000017	C-CERAMIC,DISC	1nF,10%,50V,Y5P,4x3.5,5,TP	
C163	243.4	71.8	2202-000394	C-CERAMIC,MLC-RADIAL	1nF,5%,100V,NPO,5.1x3.2,5.1,TP	
C164	257.3	72.1	2401-000597	C-AL	1uF,20%,50V,GP,4x7mm,1.5mm,TP	
C165	273.5	75.3	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C166	266	74.6	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C168	272.4	119.2	2301-000015	C-FILM,PEF	10nF,5%,100V,7x3.2x7mm,5mm,TP	
C169	315.3	212.8	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C170	188	24.2	2401-000443	CAP-AL,ELEC,106M,1E,5X5	(T)10UF,25V,20%,R-RADIAL	
C171	179.6	26.2	2401-002299	C-AL	4.7uF,20%,50V,GP,5x7,5,TP	
C172	173.9	22.8	2401-002299	C-AL	4.7uF,20%,50V,GP,5x7,5,TP	
C175	187.8	43.6	2201-000138	C-CERAMIC,DISC	100pF,10%,50V,Y5P,4.0X4.0,2.5	
C176	187.7	47.3	2201-000138	C-CERAMIC,DISC	100pF,10%,50V,Y5P,4.0X4.0,2.5	
C177	187.7	50.9	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C178	187.7	55.3	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
C179	173	49.8	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C180	168.2	49.8	2401-000597	C-AL	1uF,20%,50V,GP,4x7mm,1.5mm,TP	
C182	172.8	40.6	2201-000138	C-CERAMIC,DISC	100pF,10%,50V,Y5P,4.0X4.0,2.5	
C183	172.9	31.4	2202-000344	C-CERAMIC,MLC-RADIAL	10nF,10%,50V,X7R,3.8x5.8,5.1,T	
C184	163.7	41.3	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
C301	184	80.2	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C302	120.4	84.1	2301-000287	C-FILM,PEF	5.6nF,5%,100V,10.5x12.5x6.5,5m	
C305	126.8	82.6	2201-000013	CAP-CERAMIC,471K,1H,Y5P	470PF,50V,10%,10%,Y5P,DISC-RADI	
C306	163.5	66	2401-000042	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C307	157.9	62.4	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C308	157	79.1	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C309	139.3	73.9	2401-000039	CAP-AL.ELEC,108M.1C,10x16	(T)1000UF,16V,20%,R-RADIAL	
C310	144.7	87	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C311	162	72.4	2401-000039	(T)1000UF,16V,20%,R-RADI	CAP-AL.ELEC,108M.1C,10x16	
C312	154.6	94.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C313	146.6	70.6	2401-000324	(T)100UF,35V,20%,R-RADIAL	CAP-AL.ELEC,107M,1V,6.3x11	
C314	121.6	95.7	2305-000291	(T)63V 224J	CAP-MPETP,224J,1J,5P	
C315	121.5	88.9	2301-000013	(T)100V 472J	CAP-MYLAR,472J,2A,5P	
C316	169.1	65.9	2301-000013	(T)100V 472J	CAP-MYLAR,472J,2A,5P	
C318	141.4	55.1	2401-000597	C-AL	1uF,20%,50V,GP,4x7mm,1.5mm,TP	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C319	123.3	66.2	2301-000015	C-FILM,PEF	10nF,5%,100V,7x3.2x7mm,5mm,TP	
C320	125.5	76.2	2401-001178	C-AL	33uF,20%,25V,GP,6.3x11mm,5mm,T	
C477	101.1	108.2	2401-001016	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	
CB01	297.3	39.1	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CB02	299.3	60.2	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CB03	318.4	47.9	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CB04	303.5	76	2202-000321	CAP-CERAMIC,104J,1H	100NF,50V,5%,X7R,RE-RADIAL,DIPP	
CB06	318.3	159.2	2201-000576	C-CERAMIC,DISC	47pF,5%,50V,SL,4x4mm,2.5mm,TP	
CB07	269.3	160.5	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CB08	254.4	202.4	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CB09	262.9	196.7	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CB11	324.3	206.9	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CB14	274.3	164.8	2201-002060	C-CERAMIC,DISC	22pF,5%,500V,SL,TP,6.3x4,5	
CG01	272.6	40.5	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CG02	274.1	57.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG03	280.1	45.4	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CG04	291.2	76.3	2202-000321	CAP-CERAMIC,104J,1H	100NF,50V,5%,X7R,RE-RADIAL,DIPP	
CG06	315.4	151.9	2201-000576	C-CERAMIC,DISC	47pF,5%,50V,SL,4x4mm,2.5mm,TP	
CG07	269.3	151.8	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CG08	276.3	195.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG09	279.6	197.1	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CG11	324.3	196.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG14	274.4	156.2	2201-002060	C-CERAMIC,DISC	22pF,5%,500V,SL,TP,6.3x4,5	
CN101	253.4	16.4	3701-001018	CONNECTOR-DSUB	15P,3R,FEMALE,STRAIGHT,AU30	
CN102	187.9	114.9	3711-003854	CONNECTOR-HEADER	BOX,15P,1R,2mm,ANGLE,SN	
CN104	134	116.1	3711-003245	CONNECTOR-HEADER	NOWALL,14P,1R,2.5mm,ANGLE,SN	
CN105	255.2	143.7	3711-000609	CONNECTOR-HEADER	BOX,11P,1R,2.50mm,ANGLE,SN	
CN301	114.1	109.8	3711-000205	CONNECTOR-HEADER	1WALL,3P,1R,3.96mm,ANGLE,SN	
CN402	108.2	114.8	3711-000194	CONNECTOR-HEADER	1WALL,3P,1R,2.5mm,ANGLE,SN	
CR01	248.8	44.4	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CR02	254.3	58.4	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR03	255.9	48.9	2401-000443	(T)10UF,25V,20%,R-RADIAL	CAP-AL,ELEC,106M,1E,5X5	
CR04	281	80.5	2202-000321	CAP-CERAMIC,104J,1H	100NF,50V,5%,X7R,RE-RADIAL,DIPP	
CR06	318.5	138.9	2201-000576	C-CERAMIC,DISC	47pF,5%,50V,SL,4x4mm,2.5mm,TP	
CR07	269.3	143.4	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CR08	293.3	199.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR09	294.8	196.5	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CR11	324.3	186.4	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR14	269.4	147.6	2201-002060	C-CERAMIC,DISC	22pF,5%,500V,SL,TP,6.3x4,5	
D101	233.7	26.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D103	220.5	80.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D104	220.8	27.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D105	265.7	129.9	0402-000006	1000V,1A,1.1V,1A,2uS	DIODE-REC,1N4007GP,DO-41	
D106	254.7	133.7	0402-000006	1000V,1A,1.1V,1A,2uS	DIODE-REC,1N4007GP,DO-41	
D107	243	75.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D108	254.8	73.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D302	144.6	90.7	0402-000128	70V,1A,1.1V,1A,2000NS,0.5A	DIODE-REC,1N4002,DO-41	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
D303	128	66.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D304	173.3	77.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D470	119.1	60.3	0402-000007	DIODE-RECTIFIER	1N4937GP,600V,1A,DO-41	
DB01	289.3	24.4	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB02	297.3	21.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB03	303.6	45.9	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB04	306.5	45.9	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB05	311.2	26.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB06	308.4	34.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB07	280.1	160.5	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DB08	259.2	193	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DB09	277.5	170.5	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DB10	264	209.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG01	265.9	26.9	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG02	273.9	24.3	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG03	268.5	46.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG04	291.8	46.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG05	284.5	28.3	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG06	282	36.4	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG07	281.1	151.2	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DG08	275.3	193	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DG09	277.6	135.4	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DG10	280.4	211	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR01	250.4	28.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR02	242.4	26.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR03	239.1	46.8	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR04	267.3	49.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR05	256.3	32.4	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR06	258.9	40.4	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR07	284.5	138.8	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DR08	291.2	192.9	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DR09	281.5	130.7	0401-000006	250V,250MA,1V,100MA	DIODE-SIG,BAV21,DO-35	
DR10	294	209.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
G	287.3	41	3705-000103		CON-JACK BNC	
H_BNC	287.3	17	3705-000103		CON-JACK BNC	
HS1	289.2	146.5	BH62-30410C	HEAT/SINK	A6063S,T1.8,ALL	
HS2	232.3	6	BH75-10498A	UNIT/BRKT	CGX1609,SPTE,DC-2901S,SN	
HS3	153.2	101	BH62-30410B	HEAT/SINK	A6063S,T1.8,ALL	
HYB1	323.3	103.8	3711-002658	CONNECTOR-HEADER	3WALL,4P,SN,2.5mm,STRAIGHT,SN	
IC02	302.6	128.7	BH13-10335P	IC-DYNAMIC FOCUS	S-PROJECT,M52723ASP,DIP,20P,DY	
IC03	256.7	87.9	BH09-10304A	IC-MICOM MASKING	CSH-CHASSIS,LSC4309P2,24P,OSD	
IC04	210.1	66.8	0801-000699	DIP,4,300MIL,QUAD	IC-MOS,74HC125,QUAD	
IC05	213.5	50.4	0801-000337	IC-CMOS LOGIC	74HCT14,SCHIMITT INVERTER,DIP	
IC06	317.4	184.9	1201-001242	IC-EEPROM	52324,128X8BIT,DIP,8P,300MIL	
IC07			1103-001087	IC-EEPROM	24LC21A,128X8BIT,DIP,8P,300MIL	
IC301	149.4	82.4	1204-000308		IC-LIN,8172,VERTICAL	
IC302	117.2	69.8	1203-000002	IC-POSI.ADJUST REG.	431,TO-92,3P,PLASTIC,2.44/2.	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
IC403	98.7	87.8	1201-001034	PR:IC-AMPLIFIER	L272M,DIP,8P,28V,1A,1W,STICK	
L101	242.9	111.7	2701-000125	INDUCTOR-AXIAL,150UH	FIX,150UH,10%,50,2.6X7MM	
L103	184.2	54.3	2701-000115	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	
Q101	238.3	101.8	0501-000122	TR-SMALL SIGNAL	KSP2222A,NPN,625mW,TO-92,TP,10	
Q104	196.8	20	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q106	242.4	63	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q107	228.6	63.1	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q108	266.4	213	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
Q303	184.8	65.6	0501-000586	0.25W,60V,50V,5V,0.15A	TR-NPN,KSC945,TO-92,EBC	
QB01	306.5	56.4	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QB02	315.6	56.4	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QB05	265.6	205.4	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
QG01	281.1	56.4	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QG02	290.6	54.8	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QG05	281	206.7	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
QR01	261.5	55.8	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QR02	267.7	55.8	0501-000621	0.45W,30V,15V,4.5V,8MA	TR-NPN,2N5770,TO-92	
QR05	296.7	205.8	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
R	263.3	41	3705-000103	CON-JACK BNC		
R101	204.4	81	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R102	204.4	83.6	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R103	252.5	101.2	2001-000046	R-CARBON	1.8Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R104	253.4	103.5	2001-000046	R-CARBON	1.8Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R105	254.2	99.2	2001-000059	REF-CF,5.6K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R106	246.5	94.6	2001-000097	REF-CF,1M,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R107	229.9	93.5	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R108	233.4	109	2001-000046	R-CARBON	1.8Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R109	228.9	103.3	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R110	235.1	102.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R112	246.8	70.8	2001-000054	R-CARBON	3.9Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R113	251	65.6	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R115	269.7	81.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R116	314.3	76.7	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R117	316.6	97.9	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R118	274	100.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R120	277	125.9	2004-000964	R-METAL	470Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R121	265.7	137.1	2001-000028	REF-CF,100,5%,1/2W(S)	350V,-1300 TO +350PPM/C,R-AXIAL	
R122	305.7	190.7	2004-000150	R-METAL	1.5Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R123	315.3	209.7	2001-000089	R-CARBON	150Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R124	315.3	216	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R125	322.4	156.2	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R126	206.2	42.6	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R127	216.3	39.8	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R128	230.1	75.6	2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R129	239.8	67.1	2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R130	246	55.6	2001-000856	R-CARBON	560ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R131	267.5	97.5	2001-000644	R-CARBON	330Kohm,5%,1/6W,AA,TP,1.8x3.2m	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R132	275.4	93.7	2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R133	266.4	110.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R134	266.2	113.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R135	239.3	74.7	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R136	202	55.4	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R138	103.3	75.6	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R139	226.4	82.4	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R142	218.3	24.4	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R143	203.7	28.1	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R144	203	30.7	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R145	194.2	37.2	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R146	205.8	17.4	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R147	198.4	12.1	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R149	198.4	14.6	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R150	237.2	53.2	2001-000856	R-CARBON	560ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R151	253.9	68.4	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R152	280.2	72.3	2001-000001	R-CARBON	2Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R153	254.4	182.3	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R154	301.6	216.4	2001-000042	R-CARBON	1Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R155	276.8	216.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R160	236.4	23.4	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R161	231.1	34.2	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R162	228.6	34.2	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R163	226	34.2	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R164	223.4	34.2	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R166	286.6	56.4	2001-000041	R-CARBON	820ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R170	114.6	85.3	2001-000035	R-CARBON	220ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R171	149.3	48.8	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R172	146.9	48.8	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R173	158.3	49.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R174	151.8	48.8	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R175	167.7	37.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R176	192.1	25	2001-000057	R-CARBON	5.1Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R177	183.1	12.2	2001-000064	R-CARBON	7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R178	179.9	12.2	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R180	176.8	51.5	2004-001137	R-METAL	6.8Kohm,1%,1/8W,AA,TP,1.8x3.2m	
R181	175.4	19.1	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R182	170	37.5	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R183	191.5	60.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R303	154.8	73.1	2004-000532	R-METAL	20Kohm,1%,1/4W,AA,TP,2.4x6.4mm	
R304	157.1	76.2	2004-000679	R-METAL	2Kohm,1%,1/4W,AA,TP,2.4x6.4mm	
R305	122.9	92.2	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R306	147.4	98.1	2001-000245	REF-CF,1.5,5%,1/2W	350V,-350 TO +350PPM/C,R-AXIAL	
R308	123.8	100.3	2003-000412	REF-MO,0.9,5%,2W	350V,-350 TO +350PPM/C,R-AXIAL	
R309	170.8	94.7	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R316	184.4	69.3	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R319	180.5	64	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R320	148.9	53.7	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R321	172.5	66.4	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R331	108.8	104.9	2003-000701	REF-MO,470,5%,2W(S)	500V,-200 TO +200PPM/C,R-AXIAL	
R332	145.2	67.6	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R333	117.3	85.3	2001-000088	R-CARBON	120Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R334	115.8	74.6	2001-000091	R-CARBON	220Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R335	129.2	69.6	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R336	131.8	69.6	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R337	142.3	62.3	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R430	100.1	76.8	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R434	104.7	99.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R476	104.7	102.8	2003-000276	R-METAL OXIDE	33ohm,5%,1W,AA,TP,4.3x12mm	
R477	93.6	79.4	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R478	101.3	84.7	2001-000678	REF-CF,36K,5%,1/6W	150V,-1300 TO +350PPM/C,1.9X3.2	
R479	95.1	88.1	2001-000057	R-CARBON	5.1Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R480	107.1	84.1	2003-000276	R-METAL OXIDE	33ohm,5%,1W,AA,TP,4.3x12mm	
RB01	289.4	27.1	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB02	289.3	29.6	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB03	302.5	64.1	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB04	297.1	48.6	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RB05	311.9	56.5	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB06	318.7	62.3	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB07	314.5	48.4	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RB08	318.3	39.7	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB09	313.8	34.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB10	309.3	56.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB11	309.7	101.8	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RB12	294.8	160.2	2001-000020	R-CARBON(S)	22ohm,5%,1/2W,AA,TP,2.4x6.4mm	
RB13	307.1	108.8	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB14	312.9	159.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
RB15	270.2	190.1	2001-000530	R-CARBON	240Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RB16	270.2	186.6	2004-000849	R-METAL	390Kohm,1%,1/4W,AA,TP,2.4x6.4m	
RB18	262.4	199.8	2001-000074	R-CARBON	33Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RB19	294.8	165.4	2001-000044	R-CARBON	1.2Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RB21	269.7	88.4	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB22	324	112.8	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RB23	321.7	206.9	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RG01	265.9	29.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG02	266	32.1	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG03	277.4	64.6	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG04	274.3	44.4	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RG05	287.9	53.4	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG06	294.1	61.2	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG07	285.3	48.9	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RG08	276.8	41.3	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG09	279.6	36.4	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG10	283.9	56.4	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
RG11	301.2	102	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RG12	299.5	141.7	2001-000020	R-CARBON(S)	22ohm,5%,1/2W,AA,TP,2.4x6.4mm	
RG13	304.2	108.9	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG14	306.4	143.9	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
RG15	286.3	190.1	2001-000530	R-CARBON	240Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RG16	286.3	186.6	2004-000849	R-METAL	390Kohm,1%,1/4W,AA,TP,2.4x6.4m	
RG18	273.7	202.4	2001-000074	R-CARBON	33Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RG19	289.3	156.1	2001-000044	R-CARBON	1.2Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RG21	269.7	86.1	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG22	321.5	112.8	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RG23	321.7	196.8	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RR01	250.4	31.1	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR02	250.4	33.6	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR03	257.6	63.8	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR04	248.2	49	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RR05	261.7	52.8	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR06	270.8	62.3	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR07	259.3	47.4	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RR08	252.1	49.6	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR09	253.8	40.4	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR10	264.2	66	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR11	286	103.1	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RR12	299.6	136.2	2001-000020	R-CARBON(S)	22ohm,5%,1/2W,AA,TP,2.4x6.4mm	
RR13	288.6	110.1	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR14	306.4	133.8	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
RR15	302.2	190.1	2001-000530	R-CARBON	240Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RR16	302.2	186.6	2004-000849	R-METAL	390Kohm,1%,1/4W,AA,TP,2.4x6.4m	
RR18	290.5	206.8	2001-000074	R-CARBON	33Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RR19	292.2	147.3	2001-000044	R-CARBON	1.2Kohm,5%,1/4W,AA,TP,2.4x6.4m	
RR21	269.7	83.8	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR22	324.9	156.2	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
RR23	321.7	186.4	2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	
V_BNC	311.3	17	3705-000103	CON-JACK BNC		
ZD101	231.2	15.4	0403-000007	DIODE-RECTIFIER	1N4001GP,50V,1A,DO-41	

9-3 CRT Socket PCB Parts

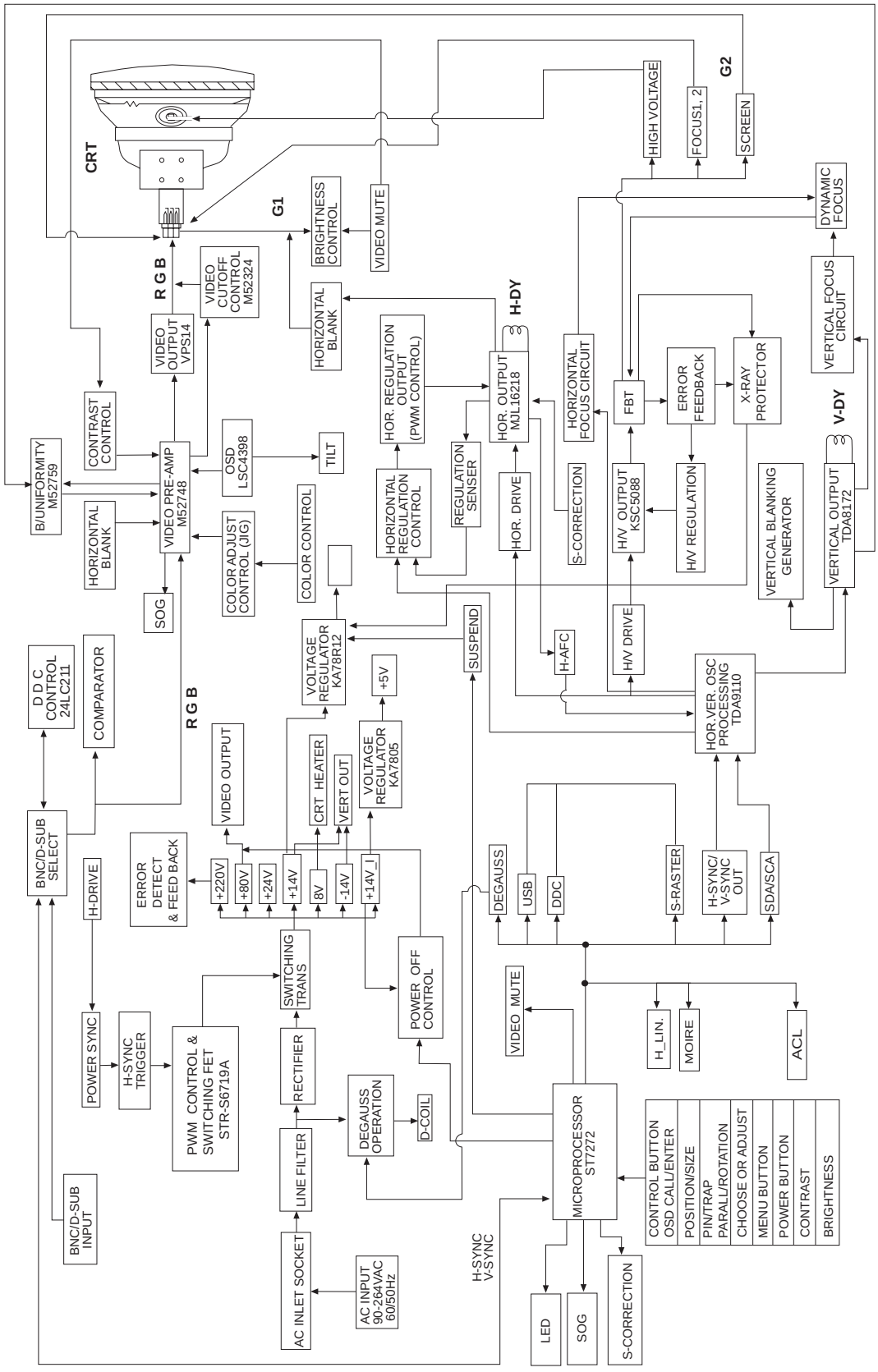
Loc. No.	Code No.	Description	Specification	Remarks
C191	2201-000019	C-CERAMIC, DISC	10NF,+80-20%,500V,Y5V,10X	⚠
C192	2201-000019	C-CERAMIC, DISC	10NF,+80-20%,500V,Y5V,10X	⚠
C193	2201-000288	C-CERAMIC, DISC	1NF,10%,2KV,Y5P,TP,10X5MM	⚠
CIS	BH70-10344C	SHIELD-CDT	CFB1577,TO.206,DEGRE	
CN181	BH39-40363V	CBF-HARNESS	11P,130MM,BLK,WHT/RED/GRN	
EY101	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
EY103	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
EY104	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
GT181	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT182	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT183	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT184	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT185	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT186	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT187	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
GT188	BH71-40300A	PIN-HINGE	BRASS,D2,36,SN,HEAT/SINK	
HC01	2202-002008	C-CERAMIC,MLC-AXIAL	10NF,+80-20%,50V,Y5V	
HC02	2202-000841	C-CERAMIC,MLC-RADIAL	33NF,10%,100V,X7R	
HC03	2202-002009	C-CERAMIC,MLC-AXIAL	100NF,+80-20%,50V,Y5V	
HCN01	3710-000192	CONNECTOR-SOCKET	4P,1R,2.5MM,ANGLE	
HD01	0401-000005	DIODE-SWITCHING	1N4148,75V,300MA,DO-35	
HIC01	1202-000119	IC-VOLTAGE COMP	319,DIP,14P,300MIL,DUAL	
HR01	2001-000056	R-CARBON	4.7KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR02	2001-000053	R-CARBON	3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR03	2001-000324	R-CARBON	120OHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR04	2001-000048	R-CARBON	2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR05	2001-000035	R-CARBON	220OHM,5%,1/8W(1/6W),AA,TP,1.8X	
HR06	2001-000077	R-CARBON	47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR07	2001-000077	R-CARBON	47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
LB191	2701-001011	INDUCTOR-AXIAL	220NH,10%,4.2X9.8MM	
LG191	2701-001011	INDUCTOR-AXIAL	220NH,10%,4.2X9.8MM	
LR191	2701-001011	INDUCTOR-AXIAL	220NH,10%,4.2X9.8MM	
R191	2003-000557	R-METAL OXIDE(S)	2.2OHM,5%,3W,AA,TP,6X16MM	
R192	2003-000438	R-METAL OXIDE(S)	1.5OHM,5%,3W,AA,TP,6X16MM	
RB192	2002-001001	R-COMPOSITION	22OHM,10%,1/2W,AA,TP,3.5X9	
RG192	2002-001001	R-COMPOSITION	22OHM,10%,1/2W,AA,TP,3.5X9	
RR192	2002-001001	R-COMPOSITION	22OHM,10%,1/2W,AA,TP,3.5X9	
SK	3704-001036	SOCKET-CRT	13P,15.24PI,29PI,NI+SN	
SKB1	4715-000106	SURGE ABSORBER	300V,CHIP	
SKG1	4715-000106	SURGE ABSORBER	300V,CHIP	
SKG11	4715-000106	SURGE ABSORBER	300V,CHIP	
SKG2	4715-000001	SURGE ABSORBER	1KV,+50-10%	
SKR1	4715-000106	SURGE ABSORBER	300V,CHIP	

Others

Loc. No.	Code No.	Description	Specification	Remarks
CRT	BH03-10339R	CRT-COLOR	19",0.26,M46QCE261X111(T5/LP)	SDD
	BH03-10339S	CRT-COLOR	19",0.26,M46LCQ683X01(E),DOUBLE	HITACHI
	BH03-10339A	CRT-COLOR	17",0.26,M41QAQ261X151(T4)	SDD
	BH03-10043A	CRT-COLOR	17",0.26,M41KSX180X12(UQ)	HITACHI
	BH03-10339L	CRT-COLOR	17",0.26,M41LLH507XX701(F3)	TOSHIBA
	BH94-10016L	ASS'Y,CDT	CSH9839T1D,SEN-BWT,19,0.26	HITACHI
	BH94-10016M	ASS'Y,CDT	CSH7839T1D,SEN-BWT,17,0.26	TOSHIBA
CRT GND	BH39-40364E	CBF-HARNESS	1P,430MM,BLK,UL1015,AWG18,1711	CSH9839L
	BH39-40364X	CBF-HARNESS	1P,300MM,BLK,UL1015,AWG18,YHF8	CSH7839L
D-COIL	BH27-10335V	COIL-DEGAUSSING	320*335*1950MM,11.3MH,13.9OHM	CSH9839L
	BH27-10335Z	COIL-DEGAUSSING	280*260*1580MM,12.5MH,16.20HM	CSH7839L
PROCESS-PBA UNIT	BH94-30008F	ASS'Y,PCB	CSH9839T1A,SEA,USA,FR-1	
	BH94-30012M	ASS'Y,PCB	CSH9839T1D,SESPO,RUSSIA	
	BH94-30011H	ASS'Y,PCB	CSH7839T1D,ELSAT,AUSTRIA	
	BH94-30012L	ASS'Y,PCB	CSH7839T1D,SEMO,RUSSIA	
	BH94-30012B	ASS'Y,PCB	CSH9839T1D,SEN-BWT,NET	HITACHI
	BH94-30012P	ASS'Y,PCB	CSH7839T1D,SEN-BWT	TOSHIBA
B/D ASS'Y CODE	BH98-10011K	ASS'Y,PCB-MAIN	CSH9839T1A,USA	
	BH98-10012D	ASS'Y,PCB-MAIN	CSH9839T1D,SESPO,RUSSIA	
	BH98-10011B	ASS'Y,PCB-MAIN	CSH7839T1D,ELSAT,AUSTRIA	
	BH98-10012C	ASS'Y,PCB-MAIN	CSH7839T1D,SEMO,RUSSIA	
	BH98-10011U	ASS'Y,PCB-MAIN	CSH9839T1D,SEN-BWT	HITACHI
	BH98-10012E	ASS'Y,PCB-MAIN	CSH7839T1D,SEN-BWT	TOSHIBA
	BH98-20003V	ASS'Y,PCB-VIDEO	CSH9839T1A,SEA,USA,FR-2	
	BH98-20004T	ASS'Y,PCB-VIDEO	CSH7839T1D,ELSAT,AUSTRIA	
	BH98-20004X	ASS'Y,PCB-VIDEO	CHS9839T1D,SEN-BWT	HITACHI
	BH98-60001M	ASS'Y,PCB-SOCKET	CSH9839T1A,SEA,USA,FR-1	
	BH98-60001L	ASS'Y,PCB-SOCKET	CSH7839T1A,SEA,USA,FR-2	
P/CORD	BH94-40001B	ASS'Y,P/CORD	GERMANY,250V/6A,1830,IVORY,DET	
	BH94-40001E	ASS'Y,P/CORD	HK,125V 7/10A,1830,IVORY,DET	
	BH94-40001Y	ASS'Y,P/CORD	UK,250V/10A,1230,IVY,DET,H05VV	
SIGNAL CABLE	BH94-50001E	ASS'Y,S/CABLE	SAMSUNG,1830,15P/15P	

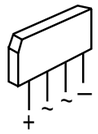
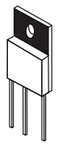
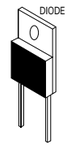
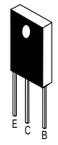
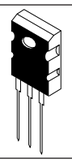
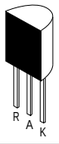
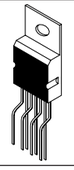
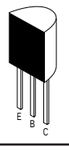
Memo

10 Block Diagram



Memo

11-1 Semiconductor Lead Identification

PARTS	TYPE NO.	REF. NO.
	RBV606	D601
	FMP-G2FS	D502
	2SC5088	Q502
	MUR10150E	D412
	KSC5042M	Q554
	MJL16218	Q407
	KA431	IC302, IC502, IC604
	TDA2006 TDA8172	IC402 IC301
	KSP945	Q204, Q253, Q303, Q404, Q653, Q654, Q655, Q656, Q657, Q658

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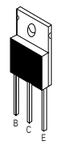
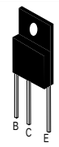
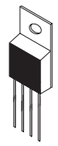
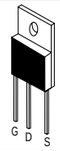
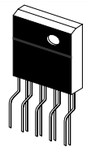
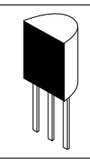
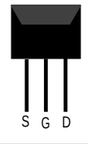
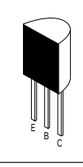
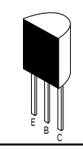
	KA7805 KSD401-Y TIP29 TIP30	IC606 Q602 Q551 Q552
	2SA1667	Q651
	KA78R12	IC605
	IRF740 IRF640 IRF630 IRF610	Q405, Q503 Q409, Q410, Q411 Q412 Q406, Q501
	STR-S6719A	IC601
	KIA7045P	IC202
	ZVN3310A	Q659
	KSP42	Q652, QR05, QG05, QB05
	KSA733	Q254, Q401, Q504, Q506

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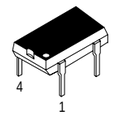
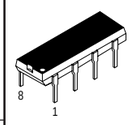
	LTV-817M-SH	IC602, IC603
	24LC21A	IC107
	KA3843B	IC401
	24LC08B	IC203
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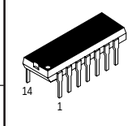
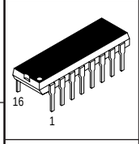
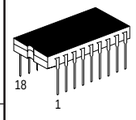
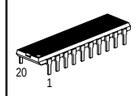
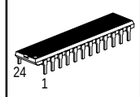
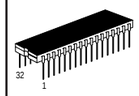
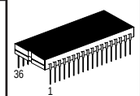
	MC74HC125AN	IC04, IC607
	74HCT14N	IC05
	74HC74N	IC608
	TL494	IC501
	M52324P	IC06
	M52759SP	IC08
	LSC4309P2	IC03
	TDA9110	IC251
	M52748SP	IC01

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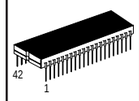
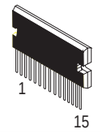
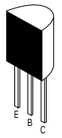
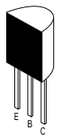
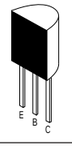
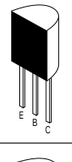
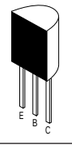
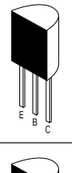
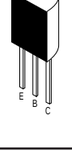
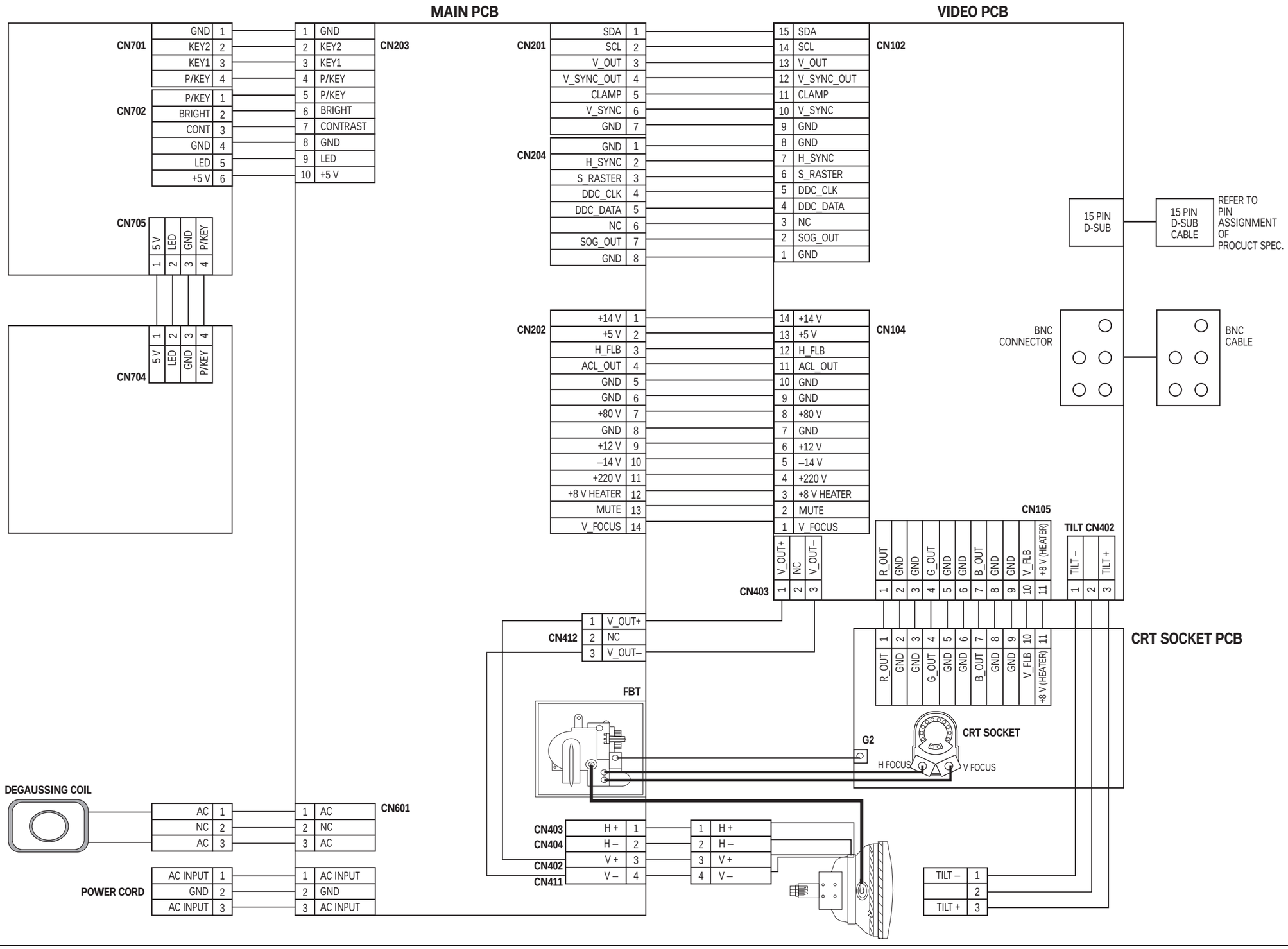
		IC201
	VPS14	IC02
	2N3904	Q101, Q102, Q201, Q202, Q203, Q252, Q402, Q403
	KSP92	QR04, QG04, QB04
	2SC1008	Q601
	2N5551	Q553
	KSP2222A	Q105, Q505
	2N5770	QR01, QR02, QG01, QG02, QB01, QB02
	KSP2907	QR06, QG06, QB06

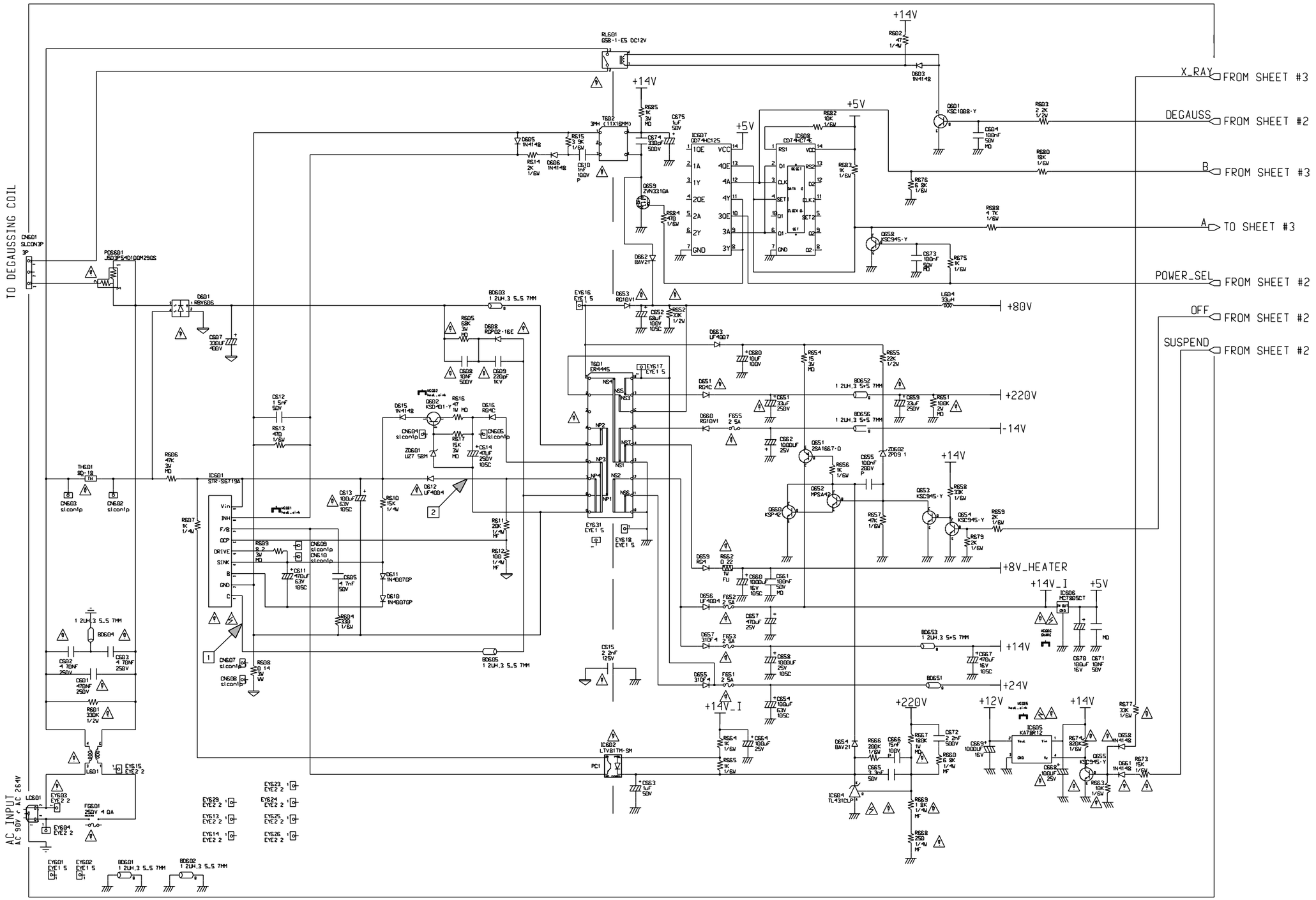
Memo

12 Wiring Diagram

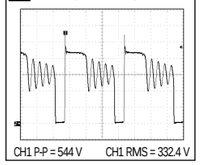


13 Schematic Diagrams

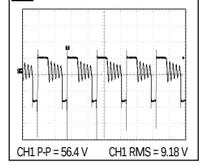
13-1 Power Part Schematic Diagram



1 544 V (IC601, #1)



2 56.4 V (T601, #7)



13-2 Micom & H/V Process Part Schematic Diagram

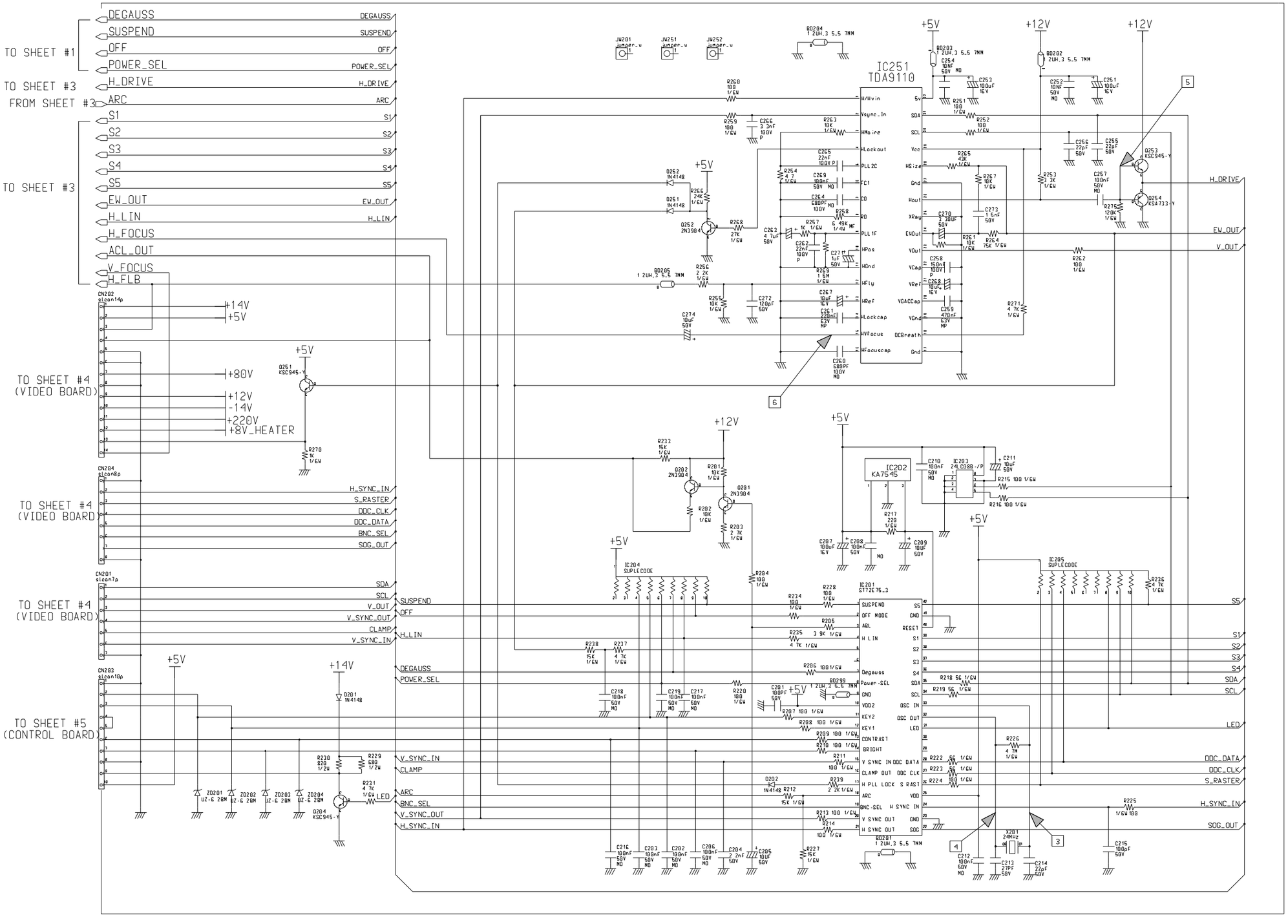


Table 13-1. IC201 (ST72E75_3)

pin #	MODES			pin #	MODES		
	31 kHz	69 kHz	96 kHz		31 kHz	69 kHz	96 kHz
1	0.239	0.238	0.241	22	3.65	3.39	3.36
2	0.210	0.210	0.212	23	GND	GND	GND
3	1.875	1.871	1.876	24	3.96	0.337	4.17
4	2.111	3.34	3.88	25	5.05	5.05	5.05
5	1.833	1.830	1.835	26	Low	Low	Low
6		–	–	27	High	High	High
7	0.237	0.236	0.239	28	–	–	–
8	3.73	3.72	0.238	29	–	–	–
9	GND	GND	GND	30	–	–	–
10	5.05	5.05	5.05	31	Low	Low	Low
11	up: 0.535, down: 1.478, left: 2.478, rignt: 3.45			32	2.258	2.258	2.258
12	pos: 0.539, pin: 1.476, menu: 2.476			33	2.233	2.233	2.233
13	3.24 ~ 5.02	3.24 ~ 5.02	3.24 ~ 5.02	34	High	High	High
14	0 ~ 5.06	0 ~ 5.06	0 ~ 5.06	35	High	High	High
15	4.51	0.02	4.5	36			
16	0.112	0.122	0.172	37			
17	Low	Low	Low	38			
18	4.64	4.46	4.39	39			
19	D-Sub : High, BNC : Low			40	5.05	5.05	5.05
20	Low	Low	Low	41	GND	GND	GND
21	0.604	0.376	0.378	42			

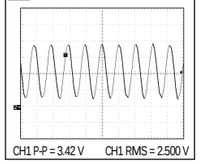
Unit: Vrms

Table 13-2. IC251 (TDA9110)

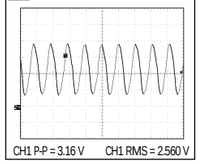
pin #	MODES			pin #	MODES		
	31 kHz	69 kHz	96 kHz		31 kHz	69 kHz	96 kHz
1	0.610	0.382	0.384	17	GND	GND	GND
2	Low	Low	Low	18	11.9	11.9	11.9
3	0 ~ 1.127	0 ~ 1.127	0 ~ 1.127	19	GND	GND	GND
4	3.28	3.28	3.28	20	5.42	5.22	5.18
5	3.121	2.469	1.96	21	8.07	8.07	8.07
6	6.35	6.35	6.35	22	3.52	3.52	3.51
7	3.96	3.96	3.96	23	3.38	3.44	3.40
8	1.515	3.32	4.69	24	2.92	2.86	2.81
9	1.517	3.32	4.7	25	Low	Low	Low
10	3.27	3.18	3.27	26	5.28	5.51	5.43
11	GND	GND	GND	27	GND	GND	GND
12	0.073	0.096	0.131	28	3.18	1.85	2.77
13	7.97	7.97	7.96	29	11.92	11.92	11.92
14	8.01	7.95	7.91	30	4.94	4.94	4.94
15	2.81	2.91	2.90	31	4.94	4.94	4.94
16	3.23	3.21	3.20	32	5.05	5.05	5.05

Unit: Vrms

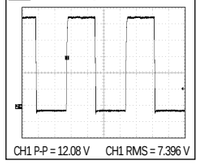
3 3.42 V (IC201, #33)



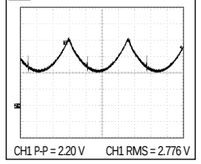
4 3.16 V (IC201, #32)



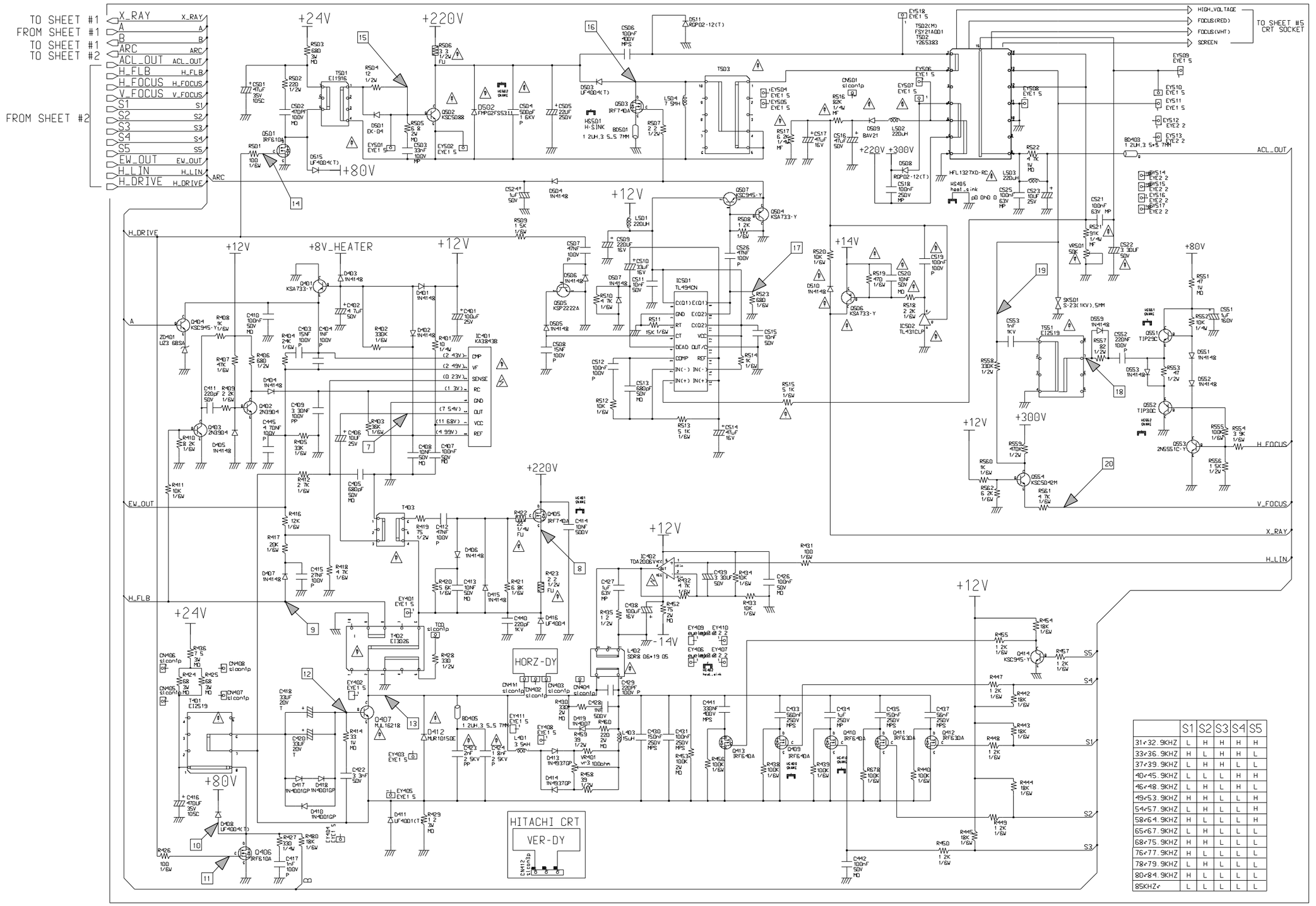
5 12.08 V (Q253, Base)



6 2.20 V (IC251, #15)



13-3 Main Part Schematic Diagram



	S1	S2	S3	S4	S5
31~32.9KHZ	L	H	H	H	H
33~36.9KHZ	H	L	H	H	L
37~39.9KHZ	L	H	H	L	L
40~45.9KHZ	L	L	L	H	H
46~48.9KHZ	L	H	L	H	L
49~53.9KHZ	H	H	L	L	H
54~57.9KHZ	L	H	L	L	H
58~64.9KHZ	H	L	L	L	H
65~67.9KHZ	L	H	L	L	L
68~75.9KHZ	H	H	L	L	L
76~77.9KHZ	H	L	L	L	L
78~79.9KHZ	L	H	L	L	L
80~84.9KHZ	H	L	L	L	L
85KHZ~	L	L	L	L	L

Table 13-3. IC401 (KA3843B)

pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	3.027	2.621	2.57
2	2.493	2.494	2.495
3	0.709	0.439	0.278
4	1.535	1.472	1.548
5	0	0	0
6	2.070	3.71	5.33
7	11.73	11.74	11.74
8	4.96	4.96	4.96

Unit: Vrms

Table 13-4. IC402 (TDA2006V)

pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	3.05	3.88	4.25
2	3.05	3.89	4.25
3	–10.79	–11.97	–11.93
4	0.286	1.916	2.631
5	11.93	11.92	11.92

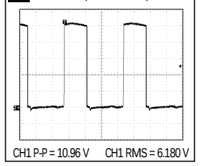
Unit: Vrms

Table 13-5. IC501 (TL494CN)

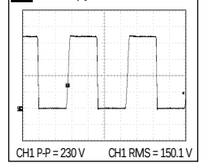
pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	4.96	4.95	4.93
2	4.96	4.96	4.96
3	1.515	1.325	1.306
4	0	0	0
5	0.656	0.601	0.611
6	3.63	3.71	3.75
7	0	0	0
8	11.88	11.86	11.85
9	2.634	4.07	4.46
10	2.634	4.07	4.46
11	11.89	11.86	11.85
12	11.89	11.86	11.85
13	0	0	0
14	4.96	4.96	4.96
15	11.88	11.86	11.85
16	4.96	4.96	4.96

Unit: Vrms

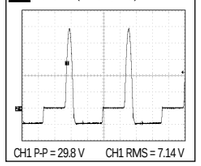
7 10.96 V (IC401, #6)



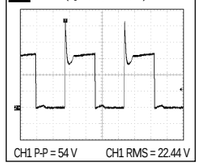
8 230 V (Q405, S



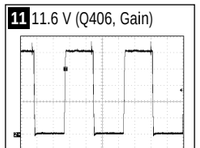
9 29.8 V (T402, #8)



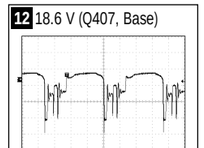
10 54 V (Q406, Drain)



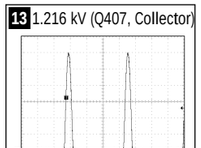
11 11.6 V (Q406, Gain)



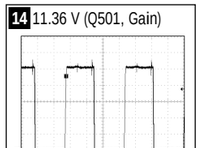
12 18.6 V (Q407, Base)



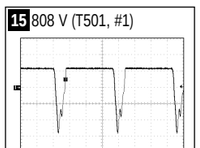
13 1.216 kV (Q407, Collector)



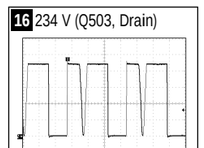
14 11.36 V (Q501, Gain)



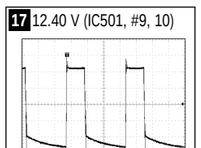
15 808 V (T501, #1)



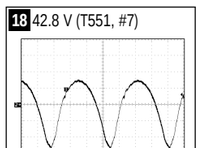
16 234 V (Q503, Drain)



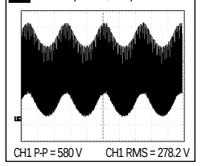
17 12.40 V (IC501, #9, 10)



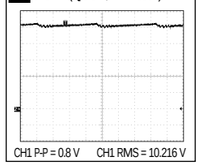
18 42.8 V (T551, #7)



19 580 V (T551, #1)



20 0.8 V (Q554, Emitter)



13-4 Video Part Schematic Diagram

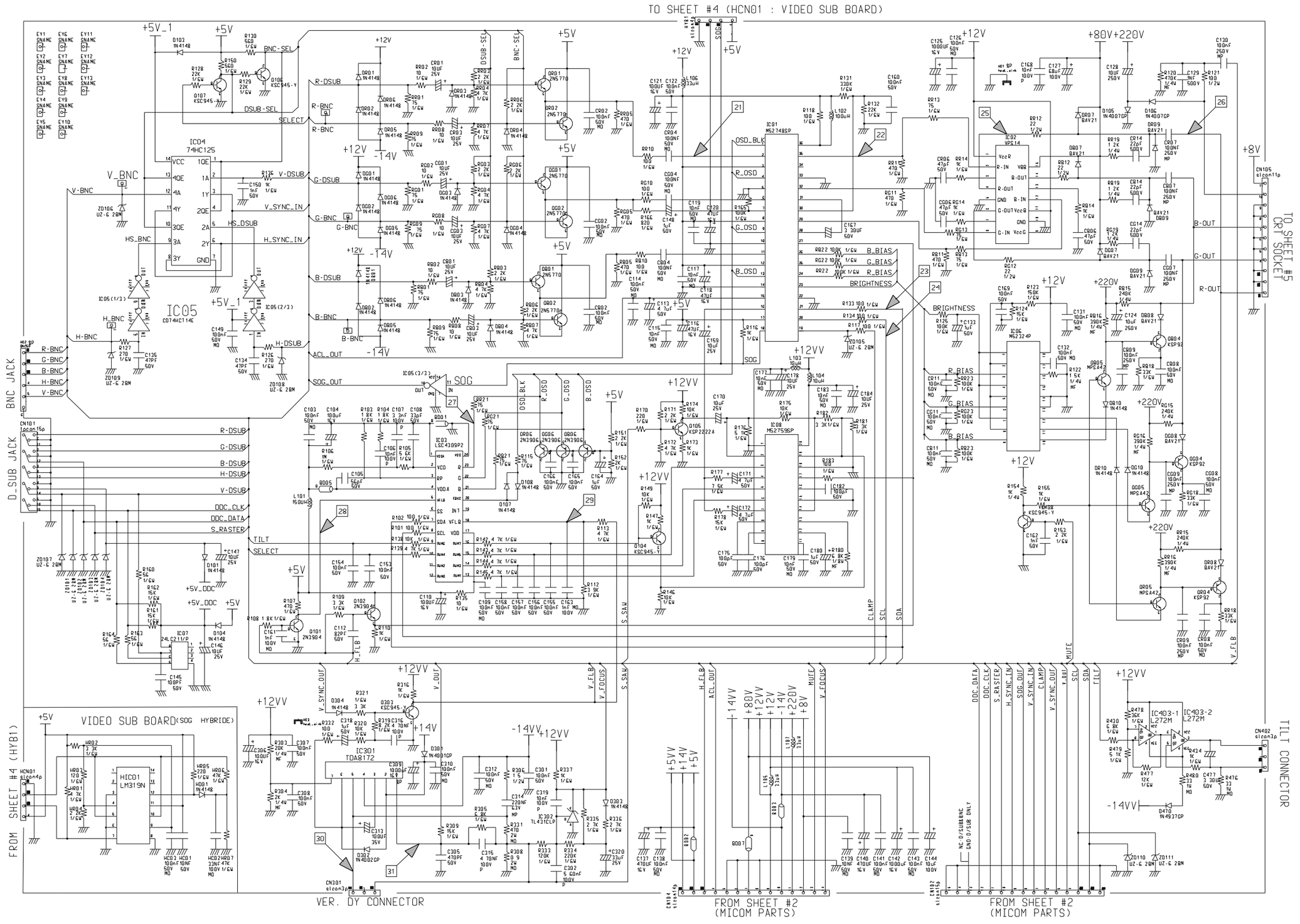


Table 13-6. IC301 (TDA8172)

pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	1.088	1.087	1.089
2	13.17	13.36	13.28
3	–13.31	–13.31	–13.31
4	–13.65	–13.88	–13.89
5	0.361	0	0.28
6	12.77	13.11	12.99
7	1.087	1.087	1.087

Unit: Vrms

Table 13-7. IC403 (L272M)

pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	1.059	1.046	1.053
2	11.9	11.9	11.9
3	11.4	11.4	11.42
4	–13.06	–13.06	–13.06
5	0	0	0
6	1.065	1.051	1.057
7	1.487	1.487	1.487
8	1.5	1.5	1.5

Unit: Vrms

Table 13-8. IC03 (LSC4309P2)

pin #	MODES			pin #	MODES		
	31 kHz	69 kHz	96 kHz		31 kHz	69 kHz	96 kHz
1	0.334	0.472	0.605	13	0	0	0
2	0.94	1.192	1.557	14	0	0	0
3	0.938	1.19	1.554	15	2.159	2.107	2.062
4	5.02	5.01	5.0	16	4.25	4.16	4.07
5	4.67	4.37	4.19	17	4.99	4.94	4.91
6	4.95	4.94	4.94	18	4.75	4.70	4.71
7	4.94	4.94	4.94	19	0	0	0
8	4.94	4.94	4.94	20	0	0	0
9	0.672	0.668	0.661	21	0.3	0.3	0.3
10	0	0	0	22	0.2	0.2	0.2
11	–	–	–	23	0.2	0.2	0.2
12	–	–	–	24	GND	GND	GND

Unit: Vrms

Table 13-9. IC06 (M52324P)

pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	0.51	0.51	0.51
2	1.08	1.08	1.08
3	1.896	1.896	1.896
4	0.51	0.51	0.51
5	1.08	1.08	1.08
6	2.21	2.21	2.21
7	0.51	0.51	0.51
8	1.08	1.08	1.08
9	2.21	2.21	2.21
10	11.2	11.2	11.2
11	11.2	11.2	11.2
12	11.2	11.2	11.2
13	GND	GND	GND
14	GND	GND	GND
15	–	–	–
16	2.97	2.97	2.97
17	4.84	4.84	4.84
18	11.8	11.8	11.8

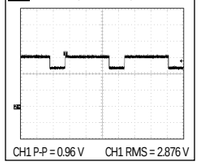
Unit: Vrms

Table 13-10. IC08 (M52759SP)

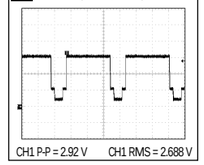
pin #	MODES		
	31 kHz	69 kHz	96 kHz
1	GND	GND	GND
2	2.333	2.333	2.333
3	2.192	2.175	2.159
4	4.93	4.93	4.93
5	0	0	0
6	0	0	0
7	7.54	7.54	7.54
8	6.0	6.0	6.0
9	6.0	5.94	5.91
10	11.87	11.87	11.87
11	2.701	2.784	2.806
12	3.85	3.96	4.04
13	1.231	1.231	1.231
14	6.91	6.91	6.91
15	GND	GND	GND
16	0.054	0.065	0.080
17	0.304	0.651	0.910
18	GND	GND	GND
19	6.08	6.04	6.0
20	11.89	11.89	11.89

Unit: Vrms

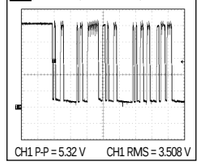
21 0.96 V (IC01, #2)



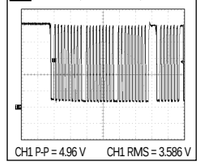
22 2.92 V (IC01, #35)



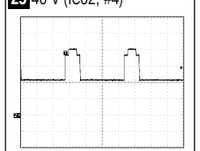
23 5.32 V (IC01, #21)



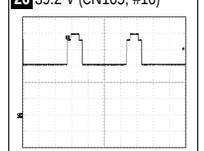
24 4.96 V (IC01, #20)



25 40 V (IC02, #4)

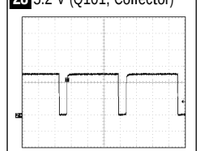


26 39.2 V (CN105, #10)

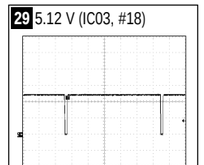


27 4.84 V (IC03, #23)

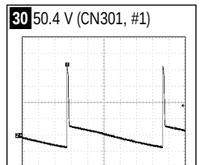
28 5.2 V (Q101, Collector)



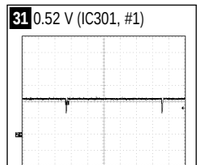
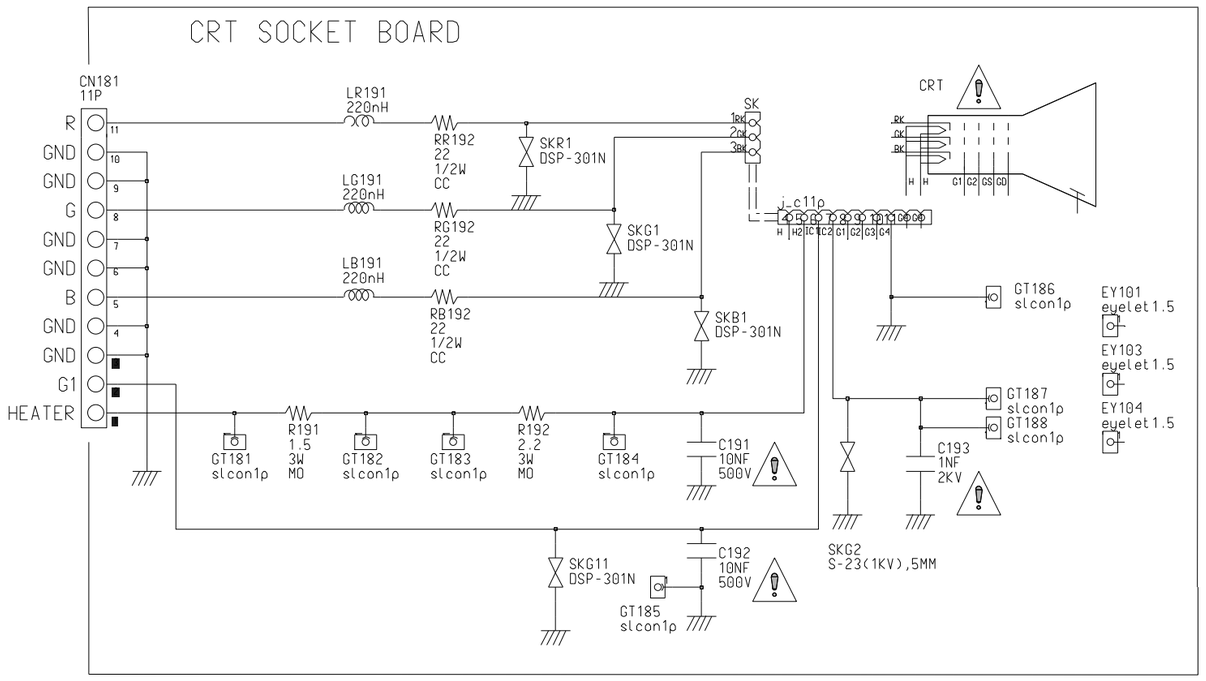
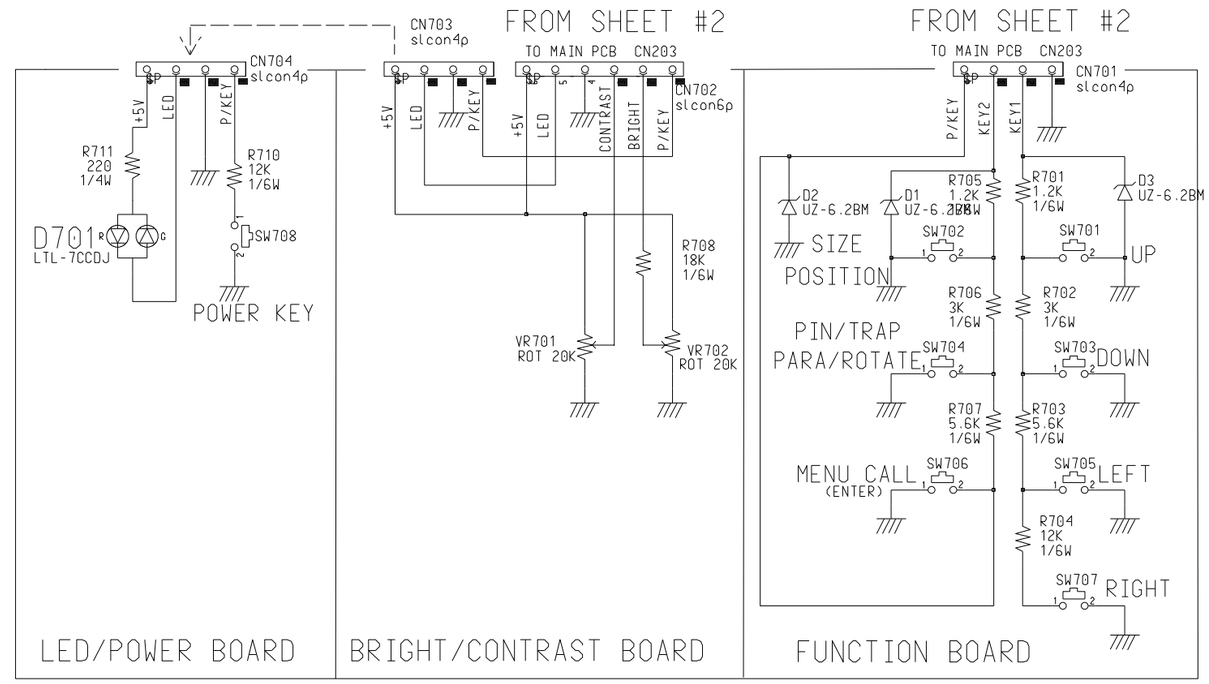
29 5.12 V (IC03, #18)



30 50.4 V (CN301, #1)



31 0.52 V (IC301, #1)



13-5 CRT Socket & Control Part Schematic Diagram